



VOL. 45, No. 2

FEBRUARY, 1977

## CONTENTS

### TECHNICAL

Newcomers Notebook	10
Radio Teletype — Part 2	6
Technical Correspondence	14
Why Radio Frequency Clipping	8

### GENERAL

AR Awards	25
Commonwealth Contest 1977	19
New Novice Operator	16
Technical Tips — CB Style	18

### DEPARTMENTS

Around the Trade	19
Awards Column	16
Contests	18
Hamads	26
IARU News	19
Intruder Watch	25
LARA	18
Letters to the Editor	20
QSP	3, 4, 22
Repeaters	19
Silent Keys	26
VHF-UHF — an expanding world	24
WIANEWS	4
WICEN	25

### COVER PHOTO

WIA Executive Member Surgeon  
Rear Admiral Jim Lloyd VK3CDR at  
his compact station (see page 6).

Photo by Reg Gauge

# HAM

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# amateur radio

## QSP THIRD PARTY TRAFFIC

At this time of the year our thoughts turn to the John Moyle Memorial Field Day. A contest which, over the years, has enabled amateurs throughout Australia to test their ability to operate radio equipment in remote locations completely independent of commercial power sources.

This ability of radio amateurs to maintain communications under extremely adverse conditions, carrying out makeshift repairs where necessary, is the attribute which makes WICEN so versatile.

Ever since the early days of radio, radio amateurs have rendered assistance during emergencies aided in no small way by their ubiquitous distribution and unique ability.

The WIA, through the Divisions, has close liaison with Individual State emergency organisations and more recently, through the Federal WICEN Co-ordinator, with the NDO.

The fact that Australian radio amateurs are prohibited from communications on behalf of third parties has been a complication in the operation of WICEN nets. Although permission has been readily granted for special training exercises it still means very rigid scheduling of them. Also, in many minor emergencies the situation could have been resolved with a minimum of "red tape".

The IUT, although making a general prohibition of International amateur third party traffic, realises that some Administrations favour third party privileges for their amateur service and make provision for agreements to be concluded between the administrations concerned to permit third party traffic.

It is therefore apparent that the simple matter of allowing Australian radio amateurs third party traffic concessions could ease a large number of problems in the utilisation of radio amateurs in emergencies and also in their training so necessary for efficiency.

Members will therefore be aware that the question of third party traffic is one that is still in mind.

(Sgd.) D. A. WARDLAW, VK3ADW,  
Federal President.

## QSP

### WHY NINE PLUS?

The editorial by WJTV in Ham Radio Nov '78 looks very familiar — "... interference on the amateur bands is something that most of us have learned to live with, at least to a certain extent, but in recent months I have noticed an increasing number of bad operating practices cropping up on our bands. Apparently other amateurs have been troubled too, because I have received a number of letters on the subject. None of these practices is new, but they're more offensive because the bands are now more crowded than they used to be. Deliberate interference, tuning up on net frequencies, playing music, calling CQ without listening first, offensive language, incorrect identification (or no identification at all), using a kilowatt when 100 watts is adequate, talking cross-town on 20 metres instead of using VHF-FM — the list could go on and on."

He goes on to enjoin good operating practices and makes the point that whilst net operations are not for everyone, at least those engaged in the nets are not elsewhere on the bands creating more QRM. And why, he asks, the big penchant for 39 signal reports (by unnecessary use of linears) when perfectly adequate QSOs can be maintained with 36 or 77.

### INTERFERENCE POSSIBILITIES

"A French manufacturer is selling and installing equipment known as 'Syndels'. This is a radio-navigation system intended for use on trawlers. Confined on 438.05 MHz, the system has a bandwidth of  $\pm 2.5$  MHz, the mode is FM and the power is 100 W. Syndels uses three beacons and the interference created extends over a considerable distance." "Radio Communication," Dec. '78.

### NOTES FROM IARU

There are now 152 member countries of the IUT. There is an IARU affiliated amateur radio society in 83 of those countries; 9 are in Region 3 and 24 in Region 2. This means there are 69 countries which do not possess an amateur radio society as a member of IARU. Numbered among these countries in Region 3 are Afghanistan (amateur radio banned), Bangladesh, China (no amateur radio), Fiji, Indonesia (active society; preparing to join IARU), Iran, Khmer Republic, Korea North, Laos, Maldives, Nepal, Nauru, PNG (society under formation) and Vietnam. There are IARU societies

in Hong Kong and W. Samoa but neither country is an IUT member. The President of Bolivia is an amateur, call sign CP1CL and also their Minister of Transportation, CP1HF. Amateurs in Bolivia can send CGL cards at one-half the regular postage rate. Region 2 News Nov '78.

### WWV AND WWVH CLOSE-DOWN

As from February 1 1977 the National Bureau of Standards (NBS) will discontinue transmissions on 2.5, 20 and 25 MHz from WWV, Colorado, and 20 MHz from WWVH, Hawaii. WWV and WWVH transmissions will continue as at present on 5, 10 and 15 MHz and also on 2.5 MHz from WWVH only.

WWV has operated for over 50 years and WWVH for over 25 years, however rising power bills and salary costs have forced the services to be reduced. In 1974 the power bill alone for WWVH was \$100,000. Within the next decade time and frequency dissemination via satellites may supersede WWV and WWVH entirely.

### IMPORTANT NOTICE TO ALL CLUB SECRETARIES

The 1977 Amateur Call Book is currently on the drawing board and the editorial staff require a complete list of all radio clubs, etc., for inclusion therein.

We earnestly request that club secretaries send details NOW, as soon as you have read this, to the Editor, Amateur Radio, P.O. Box 2611W, G.P.O., Melbourne 3001.

The following information is required—  
Meeting times and days.  
Address of club.  
Secretary's name and phone No.  
Club call sign (if any).

Details of times, etc., for any educational information.

Miscellaneous general items which is considered useful for publication.

Please note that it is hoped to publish the Call Book during May 1977, therefore all material for inclusion MUST be in the Editor's hands NO LATER THAN 31st March 1977.

Material received after that date WILL NOT be included in the 1977 Call Book—VK3UV Editor.

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# WIANEWS

Reminders to the RFMD on a range of outstanding matters elicited a telex reply during December referenced RB4/11/35.

## RTTY

The Department agrees to the use of the eight unit (start-stop) American Standard Code for Information Interchange (ASCII) and such other international codes as are recognised by the ITU. Further submissions from the Institute are required to support the request to increase the maximum frequency shift from 850 Hz to 1650 Hz.

Agreement in principle was given to the conditions relating to the method of identification when using RTTY but the Department themselves will be re-writing paragraph 112 of the Handbook. This means that on bands below 52 MHz identification can be in the mode in use or by morse code or telephony according to the type of mode actually used (reference should be made to your Divisional Council if any doubts exist about the correct mode of iden).

## GHz BANDS

The Department does not envisage the allocation for any specific use prior to WARC 79 of any of the bands requested for use by the amateur (and amateur satellite) service above 24 GHz. However consideration will be given to applications from individual amateurs wishing to conduct experiments in these bands. The bands concerned are 40-50 GHz, 71-76, 165-170 (now amended to read 155-160 because of moisture vapour absorption characteristics), 216-220, 240-250 and all above 275 GHz.

## ATV REPEATERS

Approval in principle was given for ATV repeaters with input frequencies in the 70 cm band and output frequencies in the 576-585 MHz band subject to no re-transmission of any other signals.

A wide range of other items either were not approved or were not specifically mentioned except the new call book contract — please see below.

The requests for (a) 4 amateur examinations (all classes) per annum; (b) use of CW by limited licensees in all bands above 144 MHz on passing a 5 w.p.m. exam and (c) "Parity" in maximum power levels for A1 vis-a-vis A3J stations were not approved.

Similarly turned down were various requests to amend the conditions applicable to amateur repeaters and the submission that identification periods for amateur stations be increased from 5 minute to 10 minute intervals. The latter was refused for

regulatory purposes. Also refused at the present time were requests for extensions to the 80, 40 and 6 metre bands because, they say, the WARC 79 outcome must be awaited. Present privileges granted for WIA broadcasts also would not be altered.

Other matters which will require further discussions with Central Office are (a) the acceptance procedures for activating amateur stations for emergencies as set out in paragraph 84 of the Handbook, and (b) the apparent refusal to licence beacons, repeat beacons, in bands below 52 MHz. The WIA band plan for the 430 to 440 MHz portion of the 70 cm band has been noted (including repeater frequency and simplex channels, etc.), and any amendments thereto will require submission.

Dialogue with the Department will continue in a variety of items not included in their telex such as numerous examination matters, various repeater considerations, interference procedures, etc.

## 1977 CALL BOOK

Early in January a letter was received from the Australian Government Publishing Service enclosing a contract for the 10 year period from 1977 for publishing the WIA Call Book. Many of the conditions are a re-hash of those imposed in the 1970 contract but a number will require closer examination in relation to present day conditions and procedures. If this contract is signed the first call book must be published not later than 1st May, 1977. Copyright of the contents of the entire book will vest in the Government. The whole question is currently under consideration.

## POSTAL MOTIONS

Both the postal motions listed in WIANEWS of January 77 AR have been passed by the Federal Council.

## EXAMINATIONS SYLLABUSES

The Federal Education Co-ordinator had produced a syllabus for the Novice theory examination. This is currently the subject of intensive study in many locations and it is hoped that a finally agreed draft can be prepared for submission to Central Office in the near future. Many of those concerned with its preparation have urged caution and have suggested a good syllabus is better than one hastily prepared. A draft AOC level theory syllabus has also been prepared and should be in circulation by the time this appears in AR. Any comments of a general nature would be welcomed.

The Federal President, Dr. D. A. Wardlaw, VK3ADW is scheduled to visit Sydney from the evening of February 18th and will be attending the Central Coast Field Day activities in Gosford before returning to Melbourne on Sunday evening the 20th.

A reminder. Agenda items for the 1977 Federal Convention are due; correspond with your Division. The Convention is due to be held in Melbourne from 23rd to 25th April inclusive. ■

## QSP—continued

### MOBILE OPERATION — IMPORTANT ADVICE

Because of the current "CB" activity on 27 MHz, the State Police have been empowered, by arrangement with the District Radio Inspector and Telecom, to stop and search any vehicle "suspected" of carrying or operating illegal 27 MHz equipment.

All amateurs operating mobile are therefore advised to carry with them their licence or a photo-stated copy for proof of the legality of the equipment installed in their vehicle. It is also required that the licence renewal certificate and a log book be carried.

It is also advisable that if the amateur himself is not using the vehicle, all equipment should be removed so that the XYL on her shopping trip is not booked for illegally being in possession of transmitting equipment.

From Illawarra ARS Newsletter December 1976.

## GHz BANDS

Reporting on the IARU RI VHF Managers' meeting in Amsterdam last October, G3RFE, in his Microwaves column in January 77 Radio Communication, said—"It was also suggested that deliberate efforts should be made to catalyse at least some activity at frequencies above 40 GHz since this

was now the pioneering part of the radio spectrum, and any activity by amateurs in this region would be expected to have a great impact." In the UK microwave records it was observed that 521 km was the record on 10 GHz and 154 km on 24 GHz. A world record on 3.4 GHz was recorded as 383 km between two ZL stations in 1975.

### LIGHTNING RISKS

In his T.T. column in January 77 Radio Communication, Pat Hawker devotes two columns to techniques to minimise the effects of lightning strikes on both persons and equipment. The simple precaution for people caught outdoors indicate that a squalling position away from other objects (and people) reduces the risk of being struck. In regard to aerials and lines it seems the best policy first to shunt, then to isolate. In other words, having made the shunt paths to ground as attractive as possible, the route into the equipment should be made unattractive by adding isolation, in the form of impedance. For people the best shelter appears to be in an all-metal vehicle or in a building, but out in a boat proper bonding of the mast and rigging to a metal keel seems the best preventive. It is wiser to get wet than hold an umbrella upright.

## OCEAN MISHAP

From the "Amver Bulletin" of the US Coastguard June/July '76 kindly forwarded by Dave Jeanes VK2G5J/MM on the m.v. Darwin Trader, comes a story of the aloof "Borzeny" en route from Tokyo to Los Angeles with a crew of 11 persons. The 61 foot sloop was caught in a heavy storm on 8th May about 1000 miles SW of Kodiak, Alaska, and rolled over in raging seas losing her mast, lifeboat and rudder. The only communications still operating was a small amateur radio station aboard, which, with the assistance of a piece of wire running across the deck, enabled communications to be opened with radio amateurs in San Diego, Midway and Hawaii. The crew were rescued the following day on the diversion of the CG cutter Mellon after being pinpointed by a rescue aircraft from Kodiak dropping supplies and the m.v. Camara standing by after the sighting. Dave also mentioned meeting Al Fox VP2LX/MM on his yacht "Foxfire" during a call at Darwin in October. Al and his XYL have already circumnavigated the world once and this was their second time round on route to USA via Bali, Singapore and Cape of Good Hope. ■

# SEE FRONT COVER PHOTO

## PROFILE OF VK3CDR, SURGEON REAR-ADMIRAL JIM LLOYD, QNS

Jim was first licensed as G3DKI in 1948 exchanging this for VK3AST in 1952 and VK2BST in 1966. In 1969 he was issued with the first "interstate" call sign — VK3CDR.

Two metre FM operators will have heard VK3CDR operating portable, mobile or marine-mobile. When time permits Jim also appears on 3.5, 7 and 14 MHz CW or SSB using home-brew equipment.

Amateur Radio is not Jim's only hobby. Photography, sailing, home-brewing (the real stuff), wine-making and bee-keeping all help to fill Jim's leisure hours. Not that there are many of those as since joining the RSGB in 1946 and the WIA in 1952 he has served on the VK3 Divisional Council as Federal Councillor and State President and is currently a member of the Federal Executive.

On the professional side Jim commenced his career as a medical officer in the RAN, specialising in Nuclear Defence and radiological protection. His current posting is Director-General of Naval Health Services.

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Brass tip chuck 50c

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Application	NBFM	NBFM	WBFM	WBFM	WBFM	NBFM	NBFM
Number of Filter Crystals	8	8	8	8	8	4	2
Bandwidth	12.0 kHz	15.0 kHz	30.0 kHz	36.0 kHz	40.0 kHz	14.0 kHz	14.0 kHz
Pass Band Ripple	← < 2 dB →	← < 2 dB →	← < 2 dB →	← < 2 dB →	← < 2 dB →	← < 1 dB →	← < 1 dB →
Insertion Loss	≤ 3.5 dB	≤ 3.5 dB	≤ 4.5 dB	≤ 4.5 dB	≤ 4.5 dB	≤ 3 dB	≤ 1.5 dB
Input Output	820 Ω	910 Ω	2000 Ω	2700 Ω	3000 Ω	910 Ω	7500 Ω
Termination	25 pF	25 pF	25 pF	25 pF	25 pF	35 pF	
Shape Factor	(70 dB) 2.4 (90 dB) 2.8	(70 dB) 2.3 (90 dB) 2.9	(70 dB) 2.2 (90 dB) 2.7	(70 dB) 1.9 (90 dB) 2.5	(70 dB) 2.0 (90 dB) 2.5	(40 dB) 3.0 (30 dB) 5.7	(20 dB) 1.6 (30 dB) 5.7
Ultimate Attenuation	← > 90 dB →	← > 90 dB →	← > 90 dB →	← > 90 dB →	← > 90 dB →	← > 30 dB →	← > 30 dB →
Size	← 1.27/64" x 1.31/64" x 3/16" Hg. →	← 1.27/64" x 1.31/64" x 3/16" Hg. →	← 1.27/64" x 1.31/64" x 3/16" Hg. →	← 1.27/64" x 1.31/64" x 3/16" Hg. →	← 1.27/64" x 1.31/64" x 3/16" Hg. →	Me 6/u	Me 18/u
	← Mounting Hardware Included →	← Mounting Hardware Included →	← Mounting Hardware Included →	← Mounting Hardware Included →	← Mounting Hardware Included →	can	can
Price (1-9)	← \$40.60 →	← \$40.60 →	← \$40.60 →	← \$40.60 →	← \$40.60 →	\$18.95	\$7.95



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Shipping weights: Filters 2 oz. ea., Crystals 1/2 oz. ea.  
Registration Fee: \$2.00; Air Mail: \$1c per 1/2 oz.  
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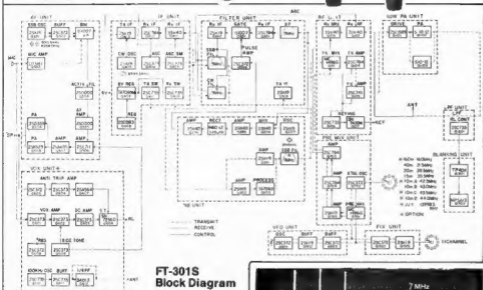




Latest addition to  
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# FT-301S ALL SOLID STATE HF TRANSCEIVER

The FT-301S is an advanced fully solid state H.F. SSB and CW transceiver covering 160 m through 10 m, including one auxiliary band and WWV. It has all the outstanding features of Yaesu's top performance FT-101E (inc. built in RF Processor) plus many more additions (compact, solid state final, low power consumption).



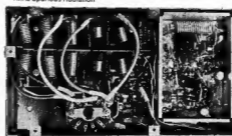
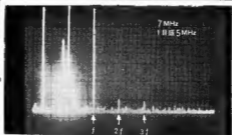
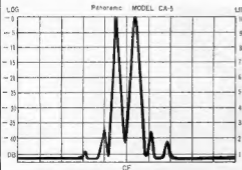
## Technical Data

**Frequency Range**  
160m 1.8-2.0 MHz \*  
80m 3.5-4.0 MHz \*  
40m 7.0-7.5 MHz \*  
20m 14.0-14.5 MHz \*  
15m 21.0-21.5 MHz \*  
10m 28.0-29.5 MHz \*  
8 29.5-29.8 MHz \*  
C 29.0-29.5 MHz \*  
C 29.5-30.0 MHz \*  
WWV 5.0-5.5 MHz \*  
Aux. 27.0-27.5 MHz \*  
**Mode**  
SSB, USB, (A3J)  
CW (A1)  
**Input Power**  
A1, A3J, 20 Watts DC  
Carrier Supp.  
Better than -40dB  
Adj. Sideband Supp.  
Better than -40dB  
Spurious Rad.  
Better than -40dB  
**Audio Response**  
300-2700 Hz = 50dB  
Intermod. Distortion  
Better than -31dB  
**Frequency Stability**  
300 Hz or better within the first 30 minutes and less than 100 Hz after warmup  
**Input Impedance**  
50 Ohm  
**Mic Impedance**  
500 Ohm  
**RX Sensitivity**  
0.5µV for 10dB SIN  
**Image Rejection**  
Better than 50dB  
**Selectivity**  
SSB —60dB at 2.4 KHz  
CW —60dB at 0.6 KHz \*  
—60dB at 1.2 KHz

**Crossmod**  
Better than 60dB with a 20dB signal at the ant. terminal 20 KHz away  
**Audio Output**  
3W at 10% THD  
**Output Impedance**  
4 Ohms  
**Supply Voltages**  
DC 13.5V Receive 0.4 Amp  
Transmit 3 Amp (at 10W)  
AC 234V Receive 40 VA  
(with FP-301) Transmit 110 VA (at 10W)  
**Dimensions**  
280mm wide, 125mm high, 260mm deep  
**Weight**  
7 kg.  
**\*Options**

**Anticipated Prices**  
FT-301S Transceiver \$658  
FV-301 Matching VFCs \$149  
FP-301 Heavy Duty AC Power Supply \$169.00  
(May also be used in power 100W final)

Eleven crystal locked channels and 10 Watts PEP make the FT-301S particularly suitable for the new Novice and, at a later date, a 100 watt outboard linear amplifier will be available from Yaesu, enabling the FT-301S to be upgraded for full licence operation. Additional plus features include automatic high VSWR protection of the final amplifier output transistors and selectable 100 KHz and 25 KHz calibration. Special care is taken to reduce unwanted harmonic radiation by the inclusion of separate double section Low Pass Filters for each band. Stocks of the FT-301S are expected toward the end of September.



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JAS7677-2-1

the armature extension. The 'Sword' will then turn clockwise such that when the cam is clear of the lug on the selector arm, the arm will swing back (because of the spring) to its original position.

The 'sword' will now push the arm of the T-piece to the left and swing it in a clockwise direction. The T-piece will, in this way, push the receiver rod No. 1 to the right. If the first pulse had been a

space the rod would have been pushed to the left. In the same way the remaining rods are pushed in place in order and the 8th cam releases a clutch which allows the typing mechanism to operate.

The five receiver bars are displaced to right or left to correspond with the received signal. The slots in the receiver bars for the letter that was transmitted, will become aligned so that the type rod

for that letter or character falls down and is struck by the hammer and the type arm is pushed towards the paper (see Fig 7).

After having completed one revolution, the cam axle will stop and the teleprinter is clear for a fresh reading.

(to be continued)

# WHY RADIO FREQUENCY CLIPPING?

Harry Leeming, G3LLL

C/- Holdings, Mincing Lane and Darnley St., Blackburn B.B.2-2AF, U.K.

There cannot be many Hams who at some time or another have not experimented with audio processing and clipping. In the past, on AM, results were quite encouraging, but for some reason the things just don't seem to work in many cases with SSB — why? Here are a few thoughts on the topic by G3LLL.

A typical block diagram of an audio processor which includes clipping and compression is shown in figure 1. This kind of unit looks quite impressive, but let us examine it stage by stage and see what we have to gain if we connect it into a good quality single-side-band transmitter.

## PREAMPLIFIER AND PRE-EMPHASIS STAGE

This stage does just about everything that a decent microphone (plus, perhaps, a bass-cut capacitor) should do. If you are short of audio gain or if you use a microphone with a bassy response, it may help, but if you use something with plenty of output and a controlled response such as, say, a Shure 444 you will gain little or nothing.

## THE COMPRESSOR STAGE

The ALC circuit in any correctly operating amateur SSB transmitter makes a very good audio compressor; why add another in series?

## CLIPPING STAGE

Most ALC circuits derive their output from the PA valves grid. Before this type of circuit can work, the PA valve has to be over-driven, and in this condition the cathode and grid form a clipping diode limiting the audio peaks and giving, whether you want it or not, several dB's of radio frequency clipping. The small amount of clipping obtained may not increase the loudness of the signal as much as 20 dB's of audio clipping, but as it will not produce any audio harmonic distortion, in many cases it will do just as good a job of improving the intelligibility.

## THE HIGH FREQUENCY FILTER

Whilst a separate audio high frequency filter may be needed to prevent square wave effects after audio clipping, it is certainly not needed to clean up any signal which is going to be passed through an SSB filter. An SSB filter has a very clearly defined response and this ensures that any high frequency distortion products are "chopped off".

Whilst, doubtless, an audio clipper will help sometimes, I doubt if it has much to offer when used with single side band equipment if the following conditions are already met:

1. A good communications type microphone with a rising response and adequate audio output is used.
2. The transmitter has an efficient ALC circuit which is derived from the PA grid.
3. Adequate drive with some clipping at the grid of the PA valve is available on all bands.

Although many would argue otherwise, my own experience is that under these conditions the only clipper giving any real hope of more than a dB or two improvement is a radio frequency clipper.

## RADIO FREQUENCY CLIPPING

To refresh your memory, the general layout needed for an "add-on" radio frequency clipper is shown in figure 2. The double-side-band signal is taken from the transmitter, and first of all converted to single-side-band by the clipper's filter FL-1. The then single-side-band signal is amplified by an amount necessary to ensure adequate clipping and is then clipped and fed via the output control back to the associated transmitter.

If things are working correctly it is impossible for a radio frequency clipper to generate audio harmonic distortion, as the SSB signal fed to the clipper diodes consists only of a bunch of radio frequencies. Harmonic distortion products in this case are at twice or more times the radio frequency, and so are filtered out by the simplest of tuned circuits. At very low levels of clipping no additional filtering is necessary, but as clipping is pushed to the higher levels needed to provide a meaningful improvement in performance, intermodulation distortion does occur and causes the signal to spread out on to adjacent channels. For this reason the signal is then fed back into the transmitter via the transmitter's original SSB filter which removes the additional side bands which have been generated by the clipping process.

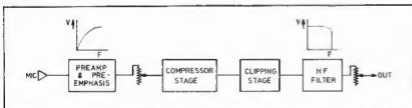


FIG. 1. AUDIO CLIPPING BLOCK DIAGRAM.

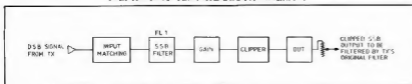


FIG. 2. RF CLIPPING BLOCK DIAGRAM.

NOTE: Clipping Level adjusted by Tx's mic gain control.

## RF CLIPPING DOES NOT ALWAYS WORK WONDERS

Have you ever been prescribed a wonder drug for hay fever? I was, and it certainly worked; that is, I think it did; but the trouble was I hardly ever woke up sufficiently to sneeze! RF clipping can also have its problems.

## HEAT

Most single-side-band rigs are rated for a 50% duty cycle on CW, and for less than this at higher power on SSB. When using any form of clipping, the speech duty cycle becomes considerably extended and if the extreme of infinite clipping was to be applied the duty cycle would become 100%. At the more realistic levels commonly used, of around 15-20 dB of clipping, you should be safe if you keep within the CW ratings, and if your equipment is not fitted with a blower, you fit one.

## DISTORTION

RF clipping properly applied does not cause objectionable harmonic or intermodulation distortion, and speech can sound excellent even at 30 dB of clipping. How then do the distorted signals which we all hear on the air on occasions, occur? The purpose of clipping the peaks is to boost up the low level signals, and RF clipping boosts up all low level signals. Distortion is, however, a low level signal, and suppose for a moment that before the application of clipping, your rig has an inbuilt distortion level of 5%. This level of distortion is quite acceptable in amateur practice, and frankly no one is likely ever to have commented. If you do go ahead and add a radio frequency clipper after the stages which have produced the distortion, you will boost up the distortion. If you go as far as to add clipping in the region of 20-30 dB, the distortion will become boosted until it is nearer to 50%, and then you will be told that your clipper is causing distortion. It is not causing distortion; it is simply amplifying the distortion which already exists.

## HUM

Here the same argument applies, as any hum which is introduced by the microphone lead, or in the early stages of the transmitter, will be boosted by an amount depending upon the level of clipping. Recently, I had a case where a RF clipper was accused of causing hum. Upon examination of the FT101 being used with it, hum could just be heard when the signal was at the S.9 +40 level without the clipper, but this had never been noticed over the air until the clipper was fitted. Further checking located a poor chassis return from the transceiver's AF board and resoldering this completely removed the hum, with or without the clipper.

## MICROPHONE

First remember that RF clipping shows up everything, and microphone distortion will be just as mercilessly amplified as any other kind of distortion. Frankly, if you do not wish to invest in a good quality micro-

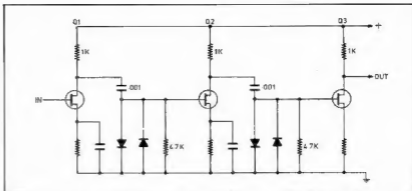


FIG. 3. RF CLIPPING CIRCUIT. GAIN OF Q2 SET AT APPROX. 10 DB.

phone, you will be wasting your money on a radio frequency clipper.

The frequencies which carry most information in speech are in the octave and a half above 1 kHz, and whether you use clipping or not, a microphone which has a peak response in this range will give maximum talk power. If you want to get the best possible from any type of clipping you must use a microphone with a rising response, and even if you use a good mic it is still worthwhile adding extra low frequency cut.

I use a Shure 444 microphone, and I have modified the VOX/PTT switch so that it adds a 2000 pF capacitor in series with the audio lead in one position. Under poor conditions switching in this capacitor is at least as good as doubling the power but somewhat cheaper!

## CLIPPING CIRCUITS

I could be wrong, but I am not personally very keen on using arrangements where clipping diodes are associated with tuned circuits. Under these conditions it is very difficult to measure just what is happening, and I cannot help feeling that it might just be possible for phase modulation to occur at some signal levels as the diodes change capacity with signal voltage. The very simplest arrangement is resistance-capacity coupling; it only being essential to ensure that there is adequate dynamic range so that clipping definitely occurs in the diodes and not in the transistors. In this connection it is helpful if two stages of clipping are used as shown in Fig. 3, the gain of Q2 being adjusted so that at the maximum level of clipping desired, say, 20 dB, clipping is shared equally by each stage.

## DOES RF CLIPPING REALLY WORK?

With a generously rated transmitter having an inherent level of distortion in the high fidelity class, it should be possible to run 40 or 50 dB of RF clipping and gain anything up to fifty times effective increase in power. Under these conditions perhaps it would be necessary to operate under ground in a padded cell to keep blower and room noises down to a reasonable level, but in any case the consideration is purely academic.

In more practical terms I use radio frequency clipping with my Yeasu FT101 mainly in a static mobile condition. Without the engine running I get only 12 volts out from the battery, and so the FT101 runs at reduced power. Under these conditions I can really "push" the FT101 without worrying about overloading the power supply or PA valves, and I often use 20 dB or more of clipping. Even at these levels of clipping I often get unasked-for comments of "excellent speech quality", and some stations have told me that apart from being much louder and easier to read with the clipper, the speech quality is actually better! This may be due to over-enthusiasm, but certainly the sound quality at any level of clipping which is within the capabilities of the FT101 is of a kind that will not upset the most critical listener.

## RECEPTION

As explained previously, before you can incorporate RF clipping it is necessary to purchase an extra SSB filter which usually is quite an expensive item. With quite a few transceivers it is possible to design the clipper so that the extra SSB filter is in circuit on reception as well as on transmit. The extra filter gives quite a notable improvement in skirt selectivity which is well worth having as it is "thrown in free of charge". This approach is not possible with all transceivers, but if you are home brewing a radio frequency clipper the possibility should certainly not be overlooked.

## CONCLUSION

Radio frequency clipping is not cheap, but dollar for dollar it seems a much better proposition than a linear amplifier. If you really want to "flatten the opposition" there is no reason why it should not be used in addition to a linear, in which case you will have talk power in the broadcasting station class! RF clipping will make an excellent rig, even better, but as it amplifies everything including any hum or distortion, one should not try and incorporate it in any equipment which is the slightest amount under par in audio quality or else the results will be disastrous. ■

# NEWCOMERS NOTEBOOK

Rodney Champness, VK3UG  
David Down, VK5HP

## SUPPRESSION OF ELECTRICAL NOISE CAUSED BY VEHICLE ELECTRICAL SYSTEMS

Reducing the electrical noise generated by the ignition and general electrical circuits of a car down to a level which does not interfere with mobile two way radio contacts can be a difficult job. If you are able to determine the source of the interference and then determine the entry path of the interference to the radio equipment you are well on the way to being able to suppress it.

As I stated in my previous article on this subject in March 1975 issue, the whole of the interference source must either be shielded completely or have suppression filters fitted where shielding is not practical.

## TRACING THE SOURCE OF THE INTERFERENCE

Tracing the source is not all that difficult as long as the task in hand is approached in a logical manner. It is assumed that the mobile has been installed in the vehicle, and can be either VHF or HF as the techniques for interference tracing are similar. Do not assume that your VHF FM transceiver will not be affected by the vehicle electrical noise because it will be, but the effects under most conditions of operation will not be particularly noticeable. Do not assume that because your set has a noise blanker or noise limiter that its performance will not be improved by attention to vehicle suppression. The reasons why this is so could be a subject of an article in itself.

With the set turned on and listening to a weak station, turn on the vehicle ignition and leave it on for about a minute. If an intermittent popping sound is heard this will most likely be coming from the voltage regulator fitted to some cars for the proper operation of their dashboard instruments. The cure for this is shown in my previous article. With the ignition on, turn on various devices within the car—heater motor, windshield wipers, tail-gate motor, turn indicators, then try bouncing the back of the car to cause the fuel gauge float to move. Some or all of these units will cause trouble but will in most cases respond to the fitting of a capacitor from the active lead (or leads) to earth using short leads. The capacitor value should be in the range of 0.1 $\mu$ F to 3 $\mu$ F, ceramic or the type used in suppression work for car radio installations. In stubborn cases, some shielding or the fitting of RF chokes into supply lines may be necessary. The interference generated from these sources may not be evident sufficiently often to warrant suppression, e.g. if you only go mobile in dry weather suppression of the windshield wipers may be a waste of time.

Having sorted out all the items causing interference whilst the car engine is not running, now comes the real test—start the motor and see how much trouble you have from this source. Interference and how???? With the engine idling or running at a couple of thousand revolutions per minute, the steady "tick-tick-tick" of the spark ignition system will be heard. Possibly another couple of noises will be heard, one could be a whine which increases in pitch as the speed of the motor is increased, and the other is a ragged scratching type of noise which is not always present and varies erratically with the charge condition of the battery, engine speed and electrical system load. The first is caused by the alternator or generator and the second is caused by the regulator. This article will concentrate on the noise caused by the ignition and battery charging circuit.

## HOW THE INTERFERENCE GETS INTO YOUR RECEIVER

You will automatically say through the aerial, of course—everyone knows that. But does it? Not always. It sometimes comes in through the power leads, through defective earthing of aerial and power cables, through speaker leads and microphone leads. The most likely of these sources is the power leads. How can this be determined? With the engine running at a thousand or so revolutions, remove the aerial lead from the set. If the interference is coming through one of the leads mentioned previously, or is being picked up directly by the set, or if it is poorly shielded, interference will still be heard in the receiver. If shielding is a problem metal shields of some sort can be made up, or alternatively aluminium foil can be draped around the set and suitably bonded to act as a temporary shield.

If possible, try the set on a separate 12 volt battery, and most likely the interference will disappear. It is impractical to run the mobile station on a separate battery normally, so some means of keeping the interference out of the power line must be found. For example, many of the cheaper cassette players require a power line filter such as shown in Fig 1. These are not very practical where the current drain is more than a couple of amps or so, certainly not for a rig drawing 20 amps. If a filter is required it is usually

only required in the low level stages so it needs to be wired into the particular part of the set affected. This type of interference is mostly within the audio spectrum, and fortunately it is uncommon for the RF component to affect the set when introduced into the set in this way. The exception here of course is when a design brings the power lead into the proximity of the aerial terminal or any sensitive low level RF stage. This is a case of bad equipment design. However, before you start rebuilding your equipment it is suggested that you try the interference suppression system described below.

## RADIATED INTERFERENCE

Most of the interference that you will receive in your mobile will be of the radiated variety and as such is picked up by the aerial, if it happens to be within the noise field generated by the vehicle electrical system. The mobile aerial should be located as far from the noise producing source as is practical, usually at the opposite end of the vehicle to the engine. However, if you do a particularly good job of suppressing your vehicle's electrical system the location of the aerial may be mounted where it will conveniently do a good job.

Some time back Gavin VK3HY and Rodney VK3UG went mobile on HF only to discover that the mobile heard whilst stationary with the motor stopped, disappeared when the engine was started despite the fact that the HF transceiver was fitted with a noise blanker. Gavin and Rodney discovered this problem at great length and it was decided that something should be done about it. Each collected the various methods that they had seen used and a decision was made to try and refine a method where fly wire had been placed over the high tension leads of the vehicle ignition system. The method that is to be described shortly is an outgrowth of the system fitted to Gavin's car.

The interference generated by the ignition system is radiated in all directions escaping under the car, through the cracks and slits around the bonnet, and is conducted and reradiated from the wiring, exhaust, etc. See Fig 2 for example.

The interference radiated by the ignition must be prevented from leaving the vehicle engine compartment. The most effective way is to completely shield each spark plug line, each spark plug, the dis-

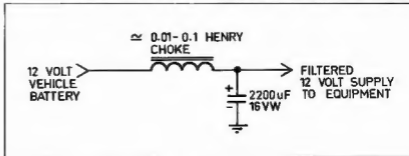


FIGURE 1

**DRAKE**

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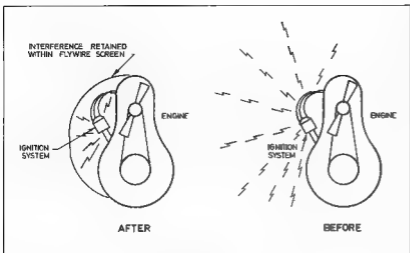


FIGURE 2

tributor, and the coil, and then filter the low tension battery supply line. A method of doing just this was shown at length in *Amateur Radio* for March 1975. It is extremely effective. It is a lot of work, but well worth it in critical situations.

Another way of completely shielding the ignition system is to put a complete shielding box over the whole of the system, and this is almost practical where all the ignition components are mounted on one side of the engine. Fortunately it has been found by experiment that it is not necessary to completely shield the ignition system and a few holes for the interference to leak through do not raise the level of interference to a high level. The experiments have been conducted on 3 Holden cars (2 HQ models and one a couple of models before) each with suc-

#### INTERFERENCE SUPPRESSION ON THE HQ HOLDEN

The method of suppression described is specifically for the HQ Holden, but the principles apply equally well with vehicles of other manufacture. The main interference suppression shield consists of bronze fly-wire, cut, folded and soldered as shown in Fig 3. The top of the screen is screwed to the rocker cover. The edge of the rocker cover is sandpapered so that good contact is made along the top of the fly-wire screen. The screen is attached by 5 small diameter self tapping screws to the rocker cover. The rocker cover should be removed to do this work. The studs which hold the rocker cover to the block are sandpapered down to bare metal as is the area surrounding each of the holes for the studs in the rocker cover. This is done to make sure of good electrical contact between the rocker cover and the engine block.

The bottom end of the screen is attached to various spots on the block of the engine. "B" is bolted to a small unused tapped hole at the rear of the engine in front of the clutch housing. The two holes

"A" are bolted to a portion of the oil filter and the lug "C" is bolted under one of the timing case cover bolts. It is necessary to make sure none of the bolts or the threaded holes in the block are rusty or the efficiency of the suppressed system will suffer. The front of the screen nearest the radiator fan should be wired to the fuel and vacuum lines so that insects are not blown behind the screen.

Prior to fitting the screen, the coil LT line must be suppressed. The ignition coil is rotated through 180 degrees. The coil and ignition leads are re-located below the coil to keep them away from the spark plug leads. The ignition switch line is filtered with a Ducon PNC51 coaxial feed-through capacitor mounted on the side of the coil. There is a small bracket on the side of the coil mount just for this purpose. The lead that went to the terminal nearest the coaxial capacitor (in the ignition switch line) is disconnected from the coil, and attached to the bottom terminal of the coaxial capacitor. The top terminal is bridged with a short piece of wire to the vacant coil low tension lead. Once the screen is refitted, the suppression of the ignition system is complete, and the cost is of the order of \$5. However, this amount of suppression is not usually enough as the alternator and regulator often contribute a considerable amount of interference.

It is necessary to shield the brown and blue wires going between the alternator and regulator. The cream coloured terminal block is removed from the two terminals at the alternator end by putting a sharp thin device down the front of each terminal entry to push each retaining lug out of its notch, and each terminal is then withdrawn noting which terminal went into which part of the block. The wires are slipped into a length of 3/4 in. coaxial cable braid which is earthed at the regulator and alternator. The red alternator to battery wire is filtered by fitting a Ducon

PNC51 coaxial capacitor into this line and mounting the capacitor to the frame of the alternator, with a small short gutter bolt in a vacant hole on the back of the alternator. The red lead is cut, one end going to one capacitor terminal, and the other lead end to the other terminal. Another coaxial capacitor is fitted to the brown wire from the regulator which disappears into the main wiring loom. The wire is cut as for the red lead and attached to the two terminals. The capacitor is mounted as close as practical to the regulator.

Usually the work as outlined above is sufficient to quieten most alternators and regulators, but some require more. It is possible to buy suppressed voltage regulators from Bosch or from their distributors Motor Spares. The type number of the suppressed regulator is RS35NS. Although an improvement, the suppressed regulator is still somewhat noisy. A Trend GR12 solid state regulator was obtained from Clayton Diesel Electric Pty. Ltd., Cnr. Green Street and Power Road, Doveton, Victoria. The solid state regulated has proved to be quiet and is cheaper than the Bosch suppressed regulator. The generating system should now be completely quiet unless you have either made some mistake in the suppression technique, or you have a defective alternator. Some alternators have extremely noisy diodes but they are not defective in any other way.

A number of bonding straps are used to earth together various items within the car that are often not earthed directly to one another. A prime example is the exhaust pipe. This is earthed at the engine to the vehicle body but a held off the car by insulated hangers right to the back of the car. The exhaust can act as an aerial for the interference. For this reason a number of bonding straps are fitted between suspected interference radiating areas. The straps can be made out of 1/2 in. or 1 cm wide copper braid. Bonding straps are required between the engine block (rear) and the fire wall, across the passenger and driver side bonnet hinges (make sure the bonnet is electrically connected to the braid as sometimes paint on the bonnet acts as an insulator), across each resilient engine mount to vehicle cross member, and one from the last exhaust pipe hanger to the car body.

#### SUMMARY

Having done all of these things you should now have a car that is fairly quiet electrically and signals down to a microvolt or so should be quite readable on your receiver without recourse to the use of a noise limiter, and the use of a noise limiter or blanker should get rid of the last vestige of interference. All earthing points must be sandpapered or scraped back to bare metal and bronze fly-wire must be used for the shield (not the cheaper aluminium or steel wire). After a number of months it may be found that the interference does come up a bit. If this is so, check that all earths are clean and clean the bronze

Available from  
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## Amateur Radio February 1977 Page 13

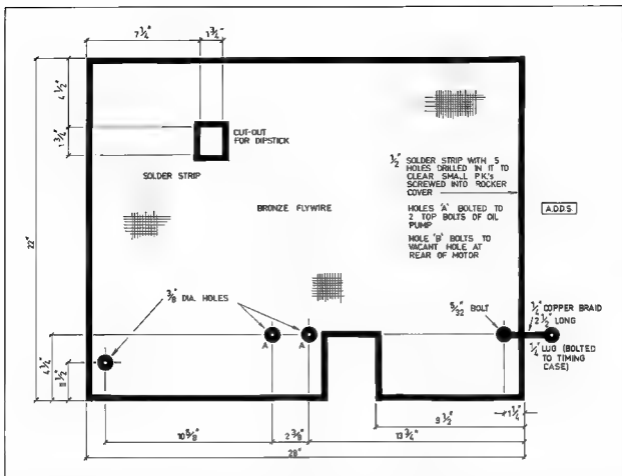


FIGURE 3

fly-wire, or if very fouled, replace it. This method of suppression is cheap and costs less than \$30 for all of the items required including the regulator if needed. It is extremely easy to remove the shield for servicing — just remove 5 screws and undo 4 bolts and the shield comes out. The carbon trace leads must be retained on the ignition system for the shielding to work.

References to read for further information  
 none

A.R. March 1975, page 5 — Vehicle Ignition Noise Suppression, by R. Champness VK3UG.

A.R. Jan. 1975, page 17 — Ignition Noise Reduction, by G. Sones, VK3AUL.

A.R. July 1976, page 11 — Starting Mobile Operation, by Maurice Evered VK3AVO.

Some time back the author obtained a copy of "Eliminating Engine Interference" by John D. Lenk. This book does not seem to be available here in Australia and was obtained direct from Ham Radio Magazine for \$U.S. 4.50. The book deals exclusively

with interference, methods of suppressing it, circuits used in receivers to overcome some of the interference problems, and some of the suppression kits that are available in America. Vicom International agents for some of these, and a more expensive than the system just described. If you are serious about getting rid of interference from a mobile environment you should try and get this book. It is a Howard W. Sams publication and bears a number 21004 which could be a stock number.

## TECHNICAL CORRESPONDENCE

The Editor,

Dear Sir  
 The Audio Starcase Generator (AR Dec. 76) has been in use for over 12 months without any noticeable drift in performance or output bias level. However, on a couple of occasions, one of the multi-vibrators has failed to start when the

power supply is switched on, on the "mains" side.

The reason is simple enough; there is no "self-start" circuit incorporated. In my case it is of little importance, as the unit is normally turned on by plugging it into a supply that is turned on already, and the sharp turn-on transient is sufficient to ensure reliable starting.

This may not be satisfactory for all applications, and a modification to the original circuit to include a "starter" gate is then necessary. Fig. 1 shows the func-

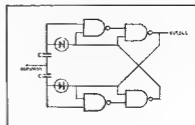


FIGURE 1



Now an addition to YAESU'S range  
of measuring instruments . . .

## QTR-24

24 hour  
World  
Clock



QTR-24

Yaesu has now made an addition to their already well known range of measuring instruments, it is the QTR-24, a 24 hour World Clock. With a glance the time in any principal city or time zone can be simultaneously coordinated with local time on a 24 Hour basis. The QTR-24 is powered by a 1.5V dry cell, which has a normal life of approximately one year. No amateur or



YO-100

FT-101E

YP-150

SWL station could be complete without one

Also shown in the photograph is the YO-100 monitor/scope, FT-101E transceiver, YC-601 digital readout adapter and YP-150 dummy load-power meter

QTR-24 PRICE \$33



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- HORNS HI-FI & P.A.
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- MATRIX BOARD
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- MICRO PROCESSOR SYSTEMS
- MIXER P.A.
- PLUGS
- RACKS (EQUIP)
- RACKS ACCESSORIES
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- SUBCONTRACT
- TURNTABLES
- TERMINAL PINS
- WIRE ENAMEL
- WIRING FACILITIES

## NEW NOVICE OPERATOR

Victoria's first novice operator, Philip Harden VK3NAA, operating his new trans-

ceiver. Philip is active on 80, 15 and 11 metres.



PHIL VK3NAA USING A FT301



MOBILE WITH FT75B

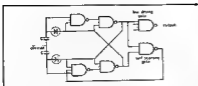


FIGURE 1

tiona circuit of each multivibrator in the original circuit and Fig. 2 is the functional circuit of a "self-starting" unit that could be used. One of the advantages of the original circuit is that the whole circuit can be built around a 25c IC. Both these circuits are taken from a TTL Application Book published some years ago by Philips.

Omissions from the circuit diagram in the December issue are the designation of an IC (MC 1498) and that pin 10 of that IC should be connected to the -5.1 volt rail.

Rodney A. J. Reynolds VK3AAR

## TECHNICAL TIPS - CB STYLE

D S Down VK5J

### Dedicated to:

The many radiating, spurling, and nauseating illegal users of the "27 MHz Band", without whose unflinching efforts, co-operation, excessive on-air time, and thorough lack of knowledge in the subject of Radio Communications, this would not have been possible.

### Introduction:

The following pearls of wisdom are repeated as copied "off air". In the interest of furthering experimentation in Radio at the higher HF level, it is requested that selfishness does not prevail—SHARE the benefit of the extra knowledge you are about to acquire with others who may be blundering along aimlessly whilst adhering to conventional theory, and especially anyone you know who is studying for any Radio-type exams.

### Tip:

1. "I've got hold of an old Army tank transmitter and receiver. It's 24 volts but I'm having the coils professionally rewound to change the circuit impedance to 27 Megs."
2. "Using a homebrew helica whip here mate. When I first made it for going mobile. I put it inside the boot to avoid detection, but it didn't work too good, so I've got it on the guard now."
3. "A five-act helica whip on a car roof sets like a panoramic reflector."
4. On hearing loca diathermy activate near 27035 kHz, one op to another: "There goes that laser from WRE again."
5. On hearing high speed CW on 27035 kHz (VK5 amateur testing keyer) First op: "I wonder what that is breaking up on a carrier?" First op: "I wonder what that is breaking up on a carrier?" Second op: "Probably Telecom trying to DF us, but they can't because we

haven't got CW fitted on our rigs. On the other hand, it might be one of the VK boys practising his Morse. I don't think it would be Telecom or VNA5 practising because they don't need to."

6. One op ashore to another using hand-phone from boat off Glenelg: "If you want to improve the signal strength from your hand-phone, grab a bit of wire, plug one end into your aerial socket and hang the other end into the water so you turn the sea into a ground plane antenna. Should work good."
7. "The PMG and Telecom have ordered new snooping gear which takes photos of your transmissions, but it only takes one. Be another waste of our taxes because by the time they get the photos back, we'll be long gone." Second op: "Yeah, but they might have got one of those Polaroid things." First op: "Yeah—I didn't think of that. So I'm going QRT in case they're on."
8. "The VK boys use 100 watts of power. Some of them use more if they are using skip licences."
9. "I'm running a 6 channel Realistic into a 5 watt helical whip."
10. "I'm going to get a Ringo or Super maxin whip which will give me 4.8 dB gain, and if I feed it with coax I should get another 5 dB."
11. "The reason more of us are going SSB is because with SSB you get more bandwidth per frequency."
12. "As far as I know, the synthesiser mixes your AM and SSB to give more frequencies. That's as far as I've read so far, but when I've done some more, I'll pass it on."
13. Experienced (?) CB-er assisting new-comer during his first QSO and with

brand new rig straight from carton: "The DX button, yeah, well if you want to work local up to about a mile, don't press it, but if you do press it, you'll bring on the skip and you won't do any good local."

14. "Glad I joined the CB club. It's a nice feeling to know you have a legitimate callign at last."
15. One mobile op (stationary mobile) to another when first op jammed by VK5 on CW: "There goes that bad high tension from the light here—it's hard to tell the difference between high tension and CW these days. There's a lot of one and not much of the other."
16. "I'm going to fit a relay to my whip so I can hear while I transmit."
17. "I wish that button pusher would pack it up, it's bokes I like that who get us egitimate operators a bad name with the R's."
18. "Don't give your 10'0 (location) the QSY to 14 and give it on SSB so the R's don't hear." Second op: "Upper or lower sideband?" First op: "Upper." Second op: "Was that channel 14 come on?" First op: "1004." Second op: "1004, we're gone."
19. First op: "What's it mean about dBs with an aerial, come on?" Second op: "It's to do with gain—if you use more than one aerial you get more gain." First op: "1004 What's gain?" Second op: "I'm not sure."
20. Two ops arranging an eyeball. QSO First op: "What colour vehicle am I looking for, come on?" Second op: "I won't give that over the air for obvious reasons, but my rego number is R—", (Actual number given)

### Conclusion

And I thought I was fairly well informed?????

# Sideband Electronics Sales

## HF TRANSCEIVERS

**ASTRO**—200 digital solid state 200 W PEP

**ATLAS** models 210-x 80 to 10 M transceiver inclusive factory installed noise blander

**YAESU MUSEN** model FT-101-E AC-DC transceivers 10 to 160 M with speech processor

**TRIO KENWOOD** model TS-520 AC-DC transceivers 10 to 80 M

**TRIO KENWOOD** model TS-820—expected shortly.

## HF RECEIVERS

**DRAKE** SSR-1 continuous coverage receiver

**YAESU MUSEN** FR6-7. Uses Wadley loop principal

## VHF TRANSCEIVERS

**ICOM** model IC-202 2 M SSB portable transceiver 144-144.4 MHz

**ICOM** model IC-502 6 M SSB portable transceivers 52-53 MHz

**TRIO KENWOOD** model TS-700-A FM-AM-CW-SSB transceivers. Full 144-148 MHz coverage, 10-Watt output, VFO controlled, self-contained, AC-DC operation

**KYOKUTO** 2 M FM 15 W output transceivers with digital read-out and crystal synthesized PLL circuitry now with 800 transmit and 1000 receive channels 5 KHz apart, covers all of 144-148 MHz, receive to 149 MHz. No more crystals to buy. Includes simplex, repeater and anti-repeater operation

## NOVICE TRANSCEIVERS 27 MHz

**TRAM** XL5 super 15-Watt PEP 23 channels AM-SSB with effective noise blander

**PAL** 69 AM, SSB 15-Watt PEP 23 channels

## SWR METERS

**SINGLE METER**

**SINGLE METER** with power scale 10-100 W

**TWIN METER**, SWR up to 200 MHz

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**PTT DYNAMIC MICROPHONES**, 50 K or 600 ohms. With 4-pin plug fitted

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## HY-GAIN ANTENNAS

**14-AVQ** 10-40 M verticals 19' tall

**18-AVT-WB** 10-80 M verticals 23' tall

**TH3JR** 10-15-20 M 3-element Yagi 12' boom

**TH3MK3** 10-15-20 M 3-element Yagi 14' boom

**TH6DX** 10-15-20 M 6-element Yagi 24' boom

**TIGER ARRAY** 204 BA 20 M 4-element 26' boom

**BN-86** balun

## ASAHI MOBILE ANTENNAS

**AS-2-DW-E**  $\frac{1}{2}$  wave 2 M mobile whip

**AS-WW**  $\frac{3}{4}$  wave 2 M mobile whip

**AS-GM** gutter clip mount with cable and connectors

**M-Ring** body mount and cap

## CUSH CRAFT ANTENNAS

**AR-2X** Ringo Ranger double  $\frac{3}{4}$  vertical for 2 M

**A147-11** 11-element 2 M Yagi

**A147-20** combination horizontal vertical 2 M

**A144-20** combination Yagi with matching harness for circular polarization

## ANTENNA ROTATORS

**Model CDR Ham-II** for all hf beams except 40 M

**Model CDR AR-22 L** junior rotator for small beams

**KEN** model KR-400 for all medium-size hf beams with internal disc brake

**KEN** model KR-500 for vertical elevation control of satellite tracking

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**6-conductor cable**, smaller size

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**DRAKE** W-4 SWR Watt-meter,

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**DRAKE** TV-3300 TVI low pass filter

**DRAKE** TV-42 TVI low pass filter, low power

**DRAKE** MN-2000 matching network

**DRAKE** MN-4 low power ant. tuner

All prices quoted are net SYDNEY, N.S.W., on cash-with-order basis, sales tax included in all cases, but subject to changes without prior notice. ALL-RISK INSURANCE from now on free with all orders over \$100; small orders add 50c for insurance. Allow for freight, postage or carriage; excess remitted will be refunded. For prompt and economical despatch we use ANSETT air freight and COMET road service.

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Amateur Radio February 1977 Page 17

# PROJECT AUSTRALIS

David Hull, VK3ZDH

# AWARDS COLUMN

Brian Austin, VK5CA

P.O. Box 7A, Crafers SA, 5152

## REMARKS 1977

### OSCAR 6

Date	Time	Long	Lat	W
1 19652	01 01	74.80		
2 19664	09 01	58.60		
3 19677	09 56	73.35		
4 19693	01 51	87.10		
5 19702	00 51	75.10		
6 19715	01 48	65.25		
7 19727	00 45	70.85		
8 19740	01 40	84.60		
9 19752	01 40	68.80		
10 19785	01 35	83.35		
11 19777	00 36	68.35		
12 19780	01 30	65.10		
13 19802	00 30	67.10		
14 19816	01 25	60.85		
15 19827	00 25	65.85		
16 19840	01 20	79.60		
17 19852	00 20	74.50		
18 19865	01 15	78.35		
19 19877	00 15	63.35		
20 19890	01 09	77.10		
21 19902	00 09	62.10		
22 19915	01 04	73.85		
23 19927	00 04	60.85		
24 19940	00 59	74.50		
25 19952	01 54	88.35		
26 19965	00 54	73.35		
27 19978	01 49	87.10		
28 19990	00 49	72.10		
29 20003	01 44	85.85		

### MARCH 1977

### OSCAR 6

20015	00 44	70.85		
20028	01 39	84.80		
20040	00 39	89.80		
20053	01 34	83.35		
20065	00 34	88.35		
6 20078	01 28	82.10		
7 20090	00 28	87.10		
8 20103	01 23	85.85		
9 20115	00 23	85.85		
10 20128	01 18	79.80		
11 20140	00 18	84.80		
12 20183	01 13	78.35		
13 20195	00 13	83.35		
14 20178	01 05	77.10		
15 20190	00 05	82.10		
16 20203	01 03	75.85		
17 20215	00 03	80.85		
18 20228	00 58	74.80		
19 20241	01 53	68.35		
20 20253	00 53	73.35		
21 20266	01 47	87.10		
22 20278	01 47	72.10		
23 20291	01 42	85.85		
24 20303	00 42	70.85		
25 20316	01 37	84.80		
26 20328	00 37	89.80		
27 20341	01 32	83.35		
28 20353	00 32	88.35		
29 20366	01 27	82.10		
30 20378	00 27	87.10		
31 20391	01 22	80.85		

Amstat has announced two target dates for future satellite test —

- 1 AOD June '77
  - 2 Phase III December '79
- Thus it seems that Oscar 6 will be another low altitude short range satellite similar to Oscar 5 and 7. This news was somewhat disappointing to Project Australis as it was hoped that 8 would provide an increased range for VK satellite users and effort expended on another low altitude satellite must detract from the Phase III program. However, the existence of the Amstat school program is recognised and the need for a continuing commitment to this will be met by AOD. It is hoped that in future programs will adhere more closely to the decisions taken at the international conferences and not be subject to post-conference Amstat pressure.

### EU-DX-D (GERMANY)

- 1 The award is available to licensed amateurs and shortwave listeners (on a "heard" basis).
- 2 The award is an annual one and contacts made between 0000 1st January and 2400 31st December are valid for that year. The first year of issue was 1964 and contacts are valid from that year.
- 3 QSL cards must be submitted with the application.
- 4 Awards are issued for all CW, all telephony, 2 x SSB and mixed modes. The "mixed modes" award requires that at least 30 per cent of the contacts are on a mode different from the other 70 per cent contacts, e.g. 70 per cent on CW and 30 per cent on 2 x SSB.
- 5 The fee for the award is DM40, 10 IRC or equivalent and stickers are DM 0.30, 2 IRC or equivalent.
- 6 The EU-DX-D Awards Manager will provide application forms and a country list for 1 IRC.
- 7 The address for applications is:
 

Walter Geyrhaller DLURK  
Post Box 262  
D-895 Kaufbeuren  
Fed Rep of Germany.

**Rules:** Each country, which may only be contacted once per year, counts as ONE point, except: on 3.5 and 1.8 MHz where each country counts as TWO points. The total points of each calendar year may be added together to obtain EU-DX-D 500 (points), for which an honorary belt is issued, and for EU-DX-D 1000 (points), for which a trophy is awarded. The calendar years do NOT have to be consecutive.

**Requirements:** A minimum of 50 points are required in any one calendar year. 20 of these points are required from European contacts and 30 from non-European contacts. Stickers are issued for each additional 10 points in the ratio of 4 European contacts and 6 non-European.

### Countries List:

CT1	IP	SV Crele
CT2	IS	SV Rhodes
DL/DJ/DK/DK	IT	TA su part
EA	JW	TF
EAB	JX	WA
E1	LA	UA FSL
E10	LA Bear Is.	UB
F	LX	UC
FC	LZ	UN
G	OE	UD
GC Jersey	OH	UP
GC Guernsey	OJ	UQ
GD	OK	UR
GI	ON	YU
GM	OY	YO
GM Shetlands	OZ	Z2
GM Orkneys	OZ Bornholm	Z82
GW	PA	3A2
HA	C/31 PX	4U1
HB	SM	8A1
HBO	SM1	9H1
HV	SP	
I	SV	

Countries outside Europe:  
ARRL country list plus the following addition —

- MPAO Das Island
- UADY Tanna Is.
- VO Newfoundland and Labrador
- VK7 Tasmania
- VSE Socotra Island
- YNO Cook Island
- Z53 Wallisbay

### WALA AWARD — NORWAY

- 1 The award is available to licensed amateurs and shortwave listeners (on a "heard" basis).
- 2 Contacts on and after 1-1-1950 are valid.
- 3 Do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager of a National Society.
- 4 The award is issued for all CW, all phone or mixed modes.

- 5 The fee for the award is 5 crowns or 10 IRC.
- 6 The address for applications is:

NRRL Awards Manager,  
Post Box 59,  
N-3551 Larvik,  
Norway

**Rules:** Contacts with JW Svalbard vW Bear Island and JX Jan Mayen count for the award.

**Requirements:** Stations must have confirmed contacts with 20 different LA (JW vX) stations on any bands with at least SIX coated north of the Arctic Circle. The QTH must be indicated on the QSL card.

# LARA

## Ladies Amateur Radio Association

As we are now a month into the New Year, it may seem inappropriate to greet members with best wishes for the year but I am going to anyway. Lack of notes from LARA last month was due to the intrusion of academic priorities into my somewhat crowded schedule and we were too late for publication sorry.

With the new year it seems appropriate to introduce LARA to those who may not have heard of us. As our family self-explanatory title suggests, we are a group of Ys who are interested in the (or all) aspects of amateur radio. Any YL can join and levels of technical expertise amongst us range from extensive knowledge to cheerful ignorance. Those in the latter group, like me, are given much help in learning about amateur radio and some LARA members will be sitting exams this month. Best of luck to these nipped adventurers! The rest of the time we manage to have fun and even up the amateur scene. Members of the group have taken part in conventions and field days of other groups and also in the more humdrum field of Institute Organisation (and herd work).

Within LARA we keep in touch with a "regular" newsletter (regularly varying from once in six months to twice a week and 800 each week). Monthly, or so, meetings are held in some States and annual general meetings once a year, or so. Formalities such as membership enquiries or just getting in touch can be handled by Norma Boye VK3AYL or Irene Robinson, who can be contacted through the Victorian Division of the Institute. For those just interested in hearing about LARA we can usually be found in the pages of this magazine. If the creative process can be sufficiently coordinated to get our efforts in on time.

# CONTESTS

Kevin Phillips, VK3AUQ  
Box 67, East Melbourne, 3002

## CONTEST CALENDAR

February	2/8	ARRL DX Phone contest
	12/13	*JOHN MOYLE MEMORIAL NATIONAL FIELD DAY
	19/20	ARRL DX CW contest
	19/20	YL-QM Phone contest
	26/27	French Phone contest
March	5/8	ARRL DX Phone contest
	5/8	YL-QM CW contest
	19/20	ARRL DX CW contest
	26/27	CQ WW WPX SSB contest
	26/28	BARTS Spring RTTY contest
April	12/13	DX YL to W/YE YL CW contest
	16/17	ARRL CQ CW Party
	23/24	ARRL CD Phone Party
	26/27	DX YL to W/YE YL Phone contest

\* Indicates a contest for the Contest Champion Trophy

## JOHN MOYLE MEMORIAL NATIONAL FIELD DAY 1977

This contest is on the week-end of 12/13 February. It is the second contest counting towards the 1977 Contest Champion Trophy, although only single operators will be eligible for trophy points. There is something for most people in this contest, whether they be a cub group, single op, vYfer, home station or SWL. So, if you have not already done so, dust the cobwebs of your rig, turn it on,

and work all your old machines and make a new one, too. And please submit logs to P.O. Box 67, East Melbourne.

#### BARTQ SPRING RTTY CONTEST

Starts at 0200 GMT on Saturday, March 26, and finishes at 0200 GMT on Monday, March 28 1977. No more than 30 hours of operating is permitted. The 18 hour non-operating period may be taken at any time, but must be at least 3 hours at a time. Scores on end of the air must be summarised on the log and score sheets. Bands used are the 3.5, 7, 14, 21, and 28 MHz Amateur bands. Stations may be worked only once per band. Countries will be taken as the ARRL Countries list with, in addition, each WVK and VE/YO call area counting as a separate country.

Exchange (a) the time GMT as a four figure number, and (b) RST and message number, consisting of a 3 figure group starting at 001 for the first contact made. Points are 2 for each 2 way RTTY contact with one's own country, and 10 for others. Bonus points of 200 will be awarded for each country worked (includes own country), a medal once per band. Contact points may be claimed once only.

Scoring is (a) QSO points times total countries, and (b) total country points times bonus points (200) times the number of contacts worked. Add (a) and (b) together for the final score.

Logs must be received by May 31st 1977. Use a separate log for each band. Logs must contain date, time GMT, call sign of station worked, RST and QSO number, and RST, QSO number received, and exchange points claimed.

Logs should be sent to Ted Dobson, GBCDW, 18 Linden Gardens, ENFIELD, Middlesex, England EN1 4DX.

## COMMONWEALTH CONTEST 1977

#### COMMONWEALTH CONTEST 1977

Australian participation in this contest has increased greatly over the last couple of years and 34 VKs sent in entries for the 1976 contest in which VK3MR took out 3rd place world-wide. Results AR December 76.)

It is felt that the above 34 could easily be doubled in the number of regular QSO operations would find a hand. The scoring system is a good one—chasing bonus points apart from contact points is a great interest in itself (it may also be success) and with the recent improvement in conditions and the weather there is more scope in the bonus area than for years past.

Try it, you'll like it!

#### TIME

1200 GMT Saturday, 12th March, to  
1200 GMT Sunday, 13th March

#### MODE

CW only 3.5 to 28 MHz. Call is CQ BUREAU!

Eligible entrants are radio amateurs licensed to operate in British Commonwealth call areas. In the regular band, VK1, VK2, VK3, Christmas, 8, Cocos, VK9, Norfolk, VK9, Heard, VK9, Macquarie, VK9, and Australian Antarctic, as well as VK1-8, are all separate contest areas.

Two trophies have been presented for competition between VK stations—a silver medal for the highest VK scorer in the official RSGB results and a bronze medal for a middle placed VK scorer based on total VK entries divided by two, that is for 34 entries, to 17th placing, for 53 entries, to 27th placing. Last year's trophy winners were VK3MR and VK5KL.

**SCORING** 5 points for contest exchange, plus 20 bonus points for 1st, 2nd and 3rd contact with each call area other than one's own (there are 111 in all with CQ, CW, CQ, etc., counting as a single area)—exotic prefixes: A2, CQ, SP, etc., etc., are the rule rather than the exception.

**LOGS.** Separate logs are required for each band showing columns—1. Date and time GMT; 2. Station worked; 3. NR sent, 4. NR received; 5. Band; 6. Wave band; 7. Contact points claimed; 8. Bonus points.

Each band log should be separately totalled and should include, at the end, a check list of areas worked on the band. Separate band totals should be added together and the total claimed score entered on a cover sheet giving particulars of

station, QTH, equipment, power, and a declaration that the rules and spirit of the contest have been observed.

Entries may be single or multi-band. Single band entries should claim entries on one band only, but submit details of contacts on other bands for checking only. Entries should be addressed to:

D. J. Andrews G3MXJ,

18 Downview Crescent, Uckfield,

Sussex, England.

Closing date 16th May 1977 (by airmail, please).

## AROUND THE TRADE

A letter received from Mr G. P. Fitzpatrick (Heatwork Engineering and Building Company) states that they hold quantities of Tefaltype Model 15 RTTY machines and are the main source of these machines in VK. These machines are given a pre-sale check and set to 50 baud. Mr. Fitzpatrick is seeking information on electronic speed controls for RTTY machines. He also suggests that the company may offer a Tefaltype machine as a competition prize.

Write to P.O. Box 98, Pyrmont, N.S.W. 2009.

**AMATEUR COMMUNICATIONS ADVANCES** (P.O. Box 57, Rozelle 2039) advise that they have available RISTON pre-coated pc boards. Riston is a dry photo-sensitive polymer film. A negative of a pc board is placed over the Riston coated board which is then exposed to sunlight or a UV source. This causes the Riston to harden. The unwanted resist is removed by a developer and the board etched. The board is then cleaned in acetone. One advantage claimed for Riston is its inextensibility to over-exposure.

PROJECT AUSTRALIS

## IARU NEWS

From Region 2 news of Nov. '76 comes news that during Sept. '76 IARU President Noel Easton VE3CJ and Region 2 President Vic Clark W4KFC visited Malta after the all Region Conference in Geneva held en route to Eastern Europe, where they held conferences with officials of the Radio Sports Federation in Moscow and the equivalents in Rumania, Hungary and Bulgaria. Wide-ranging discussions were held at each point regarding plans for WARC '79, growth and development of the world-wide amateur radio service, and means for achieving strengthened liaison among the IARU member societies of the world.

Each of the Eastern European societies had been represented at the IARU Region 1 conference in Warsaw last year and each has indicated support of plans to seek exclusive and additional world-wide amateur radio service.

Amateur radio was reported as thriving and growing in each of the countries visited, with Government encouragement and support being provided in the form of electronic components and equipment, society headquarters and club station facilities, as well as national recognition of accomplishments in amateur radio activities and competitions.

Characterised as a "radiosport", amateur radio in the Eastern European countries is valued both for its technical training attributes and the opportunities which are provided for developing operational skills through on-the-air contests, fox hunts and code speed competitions.

The amateur radio service is growing at a rate of from six to ten per cent per year in the countries visited, with increasing interest being exhibited in more exotic transmission modes such as SSTV and satellite operation.

Amateur radio in these countries makes effective use of club stations in which newer amateurs are provided with supervised on-the-air training activity. A large part of the population lives in high rise apartments in which antenna possibilities are limited by the hundreds of tall antennas that sprout from the roofs so the rate of club to individual stations tends to be greater than in western countries.

In certain countries a beginner is given the parts and materials to construct his equipment and a

six months period in which to complete the job, as a prerequisite to becoming an amateur.

News from a reliable correspondent in Africa indicates that amateur radio appears to have been banned in Malawi from about mid-1976. The reasons are not known. He also says there are now no active amateur stations from Angola, Zaire, Mozambique, Tanzania, Zanzibar, Rwanda, Burundi and Somalia. It is presumed that none will be operating from Uganda, Ethiopia and Djibouti (Afars and Issas) but this is conjecture.

## REPEATERS

Ken Jewell, VK3ZJZ

Peter Mill, VK3ZPP

The problems of keeping a column going are not made any easier by the complete lack of information and this leads me to my opening remarks. In this column we print only the facts that are supplied to us by the repeater groups and not speculative data that is freely given away by so-called informed sources. The repeater group who purchased the Electronics Australia Yearbook should carefully study the repeater listings and compare them with those that have appeared in AR. A large number of discrepancies will be noted and unfortunately people are prone to believe that it is a mistake on the part of the repeater group. A question was asked by the South Australian Repeater Committee, "What happened to our communication pipelines?" Well, that is a good question. If nothing goes in then nothing comes out, and after 10 months we have found out about all their repeaters in that State. Also if any comments in each Division wants to know what is happening on the repeater scene then we suggest they contact their Federal Councillor who receives copies of the Minutes of the FRC meetings.

#### QUEENSLAND NEWS

My thanks to George VK4ZMG for his letter bringing me up to date on the repeaters in his State in Queensland. There are now 8 repeaters in operation, or in the planning stage both VHF and UHF, and an updated listing will appear at the end of the column. Since our last listing the Townsville, Ipswich, and Toowoomba repeaters have advised that they are operational, but there are no details to hand about the equipment or operational features. Could someone please assist?

#### VICTORIAN NEWS

In the continuing saga of the Mt Macedon repeater, which a threatening to hold the record for the longest time coming they now have the receiver to go with the site, tower and antennas. When Peter VK3ZPP sorts it out there is only the Tx and Control to go. Perhaps by Christmas? The Ballarat gang have moved the repeater to a new site on Mt Buninyong and are getting coverage up to 80 kms. Their licence application is with the P & T Department and should be through soon. Up in the north-east the Mt. Bg Ben repeater is not too far away as the site has been completed and the tower and antennas are well on the way. At Geelong we have been suffering with our seasonal problems which I hope has been fixed again when you read this. The Country Fire Authority have a radio repeater in the area. Anaka each summer. This set has a lock oscillator chain that has an output 4 kHz away from the input of the repeater, causing the repeater to lock on and time out. The UHF repeaters in Melbourne are both in a state of flux with the commercial station of the 70 cm QWVXSRAD located at Dorcasdale giving a very limited range. A new site is being investigated. Because the 70 cm group was given the prime national repeater frequency as they requested, the service repeater for Melbourne will be on a secondary channel. The repeater is being installed by the Victorian Government. The equipment for the Melbourne service repeater was being prepared and the key for VK3RMM was needed to complete the installation. Finally the annual State repeater meeting is to be held soon and agenda items are invited to be submitted to the secretary, VK3AAA, 57 Rec Street Bendigo, Vic 3550.

#### SOUTH AUSTRALIAN NEWS

The mid-north repeater near Pt. Pirie VK3RMM is now on the air after a battle over the site with 3 government departments for 2 years. The equipment is all home brew except for the Tx

exciter which is a Philips 1600. The final is 2N5590 at 10 watts output. The receiver is a VK321F design and a pleasure to use to feed the station to the Hustler GE-144 6 dB gain antenna. The operating conditions of this repeater, such as time out and identification are as similar to those of the Adelaide repeaters. The second Adelaide repeater VK5RHO was originally planned to operate on channel 48 but due to a problem with harmonics from a commercial site channel 45 is being used. Once a significant number of stations have been equipped with the new channel, VK5RAD will be taken off the air for a time limit. Perhaps by the time you read this the Mt Gambier repeater will be on the air as I was originally planned to be on for the convention last year. ■

## QUEENSLAND REPEATERS

### OPERATIONS

CALLSIGN	Ch	LOCATION OR SERVICE AREA	TYPE OF IDENT	RANGE	PROJECT OFF.
VK4RBN	48	Brisbane/S.N. Glories	Audible	20 km	VK4ZMG
VK4RBC	42	Gold Coast/Mt Tamborine	Audible	60 km	VK4ZDA
VK4RAB	42	Rockhampton/Mt Archer	Audible	40 km	VK4RME
VK4RAT	42	Toowoomba/Mt Stuart	Audible	75 km	VK4KZ
VK4RDT	44	Toowoomba	Audible	80 km	VK4ND
VK4RAI	44	Ipswich	Audible	80 km	VK4CCR
VK4RGC	322/822	Gold Coast/Mt. Tamborine	Audible	7	VK4ZDA
PROPOSED					
VK4RBU	44	Bundaberg/B.H. Goomboonah	Audible	7	VK4GI
VK4RBC	352/552	Brisbane	Audible	35 km	VK4ADC

## LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

35 Florabell Street,  
Warrimoo, N.S.W. 2775.  
30-11-76.

The Editor,

Dear Sir,

I really think it is time I voiced my feelings about this so-called CB Radio in Australia.

After listening to 27 MHz sat Sunday, I was appalled to hear the large volume of so-called CB activity. There is absolutely no doubt in my mind that this activity is not CB. Far from it indeed. Let there be no quibbles about the fact that these operators are unlicensed amateurs with all the privileges of the Novice on 27 MHz. Certainly they are not operating as CBers. Listening to their air it is hard to distinguish them from the real hams, the only difference in many cases being their phoney call signs; and the activity is not just males quite a good proportion of girls were heard working their own stations. What is really galling is their apparent desire to work DX, many with home built beam antennas. I heard an enormous number of VK2's working VK6's, VK5's VK3's, VK4's and some boasting of their DX contacts overseas into Europe, ZL and VK7 and Japan. I like to work other legal hams on 27 MHz myself and I also like to work and encourage the Novices who appear on 27 MHz, but I was shocked to hear Novices, both CW and phone being severely interfered with by very heavy QRM from the pirates. They run 5 and 7's to 5 and 8's signal strength and 5's to 8's on DX in some cases.

I understand the WIA has no real policy regarding CB activity in Australia. The reality rocks me. I think too many inattentive people who should sound a louder eternal more discerning voice, are taking too soft a line against illegal CB. Get cracking and be more energetic and active in trying to put CB, if it is to flourish, in its right place. Try even, a few articles in the newspapers!

Another disturbing note was raised when I went into two large electronic retail stores in Sydney recently and witnessed the blatant way CB equipment is being sold over the counter.

Many real hams have voiced their concern over the ham bands and it is now time to act before we all, WIA included, regret old indifference or our tolerance, or whatever it might be called.

Frank Wright VK2BZ.

The Editor,  
Amateur Radio,  
Dear Sir,

On behalf of a large number of members of the WA VHF Group I express concern at the new rules for the Ross Hill VHF Contest 1976-77. The rules deny all amateurs a chance to participate with frequency and distance.

It was my understanding that one of the main purposes of this contest was to encourage activity on all VHF/UHF bands, to have amateurs improve the technical performance of their equipment and to explore propagation characteristics. The scoring system announced without warning does not allow all amateurs a chance to participate with the thought of winning.

The VK5 call area is the largest in Australia, and the minimum distance for any contact to a new call area from the south-west of this State is over 2000 km—contrast this with all other VK call areas!

VK6 amateurs will be there to work DX—but as for the contest—it's another reason to secede! Please restore incentive for activity on higher frequency bands and give a bonus for distance worked not according to political boundaries of call areas!

W J Howe VK6KZ on behalf of 6MR, 6AU, 6DY, 6ZKO, 6ZGG, 6ZKF, 6SS, 6ZBW, 6BY, 6CU, 6ZK, 6ZKV, 6ZED, 6ZAC, 6ZKF, 6IG, 6ZDM, 6ZAF, 6ZEG, 6ZED, 6ZD, 6ZT, 6ZK, 6ZIS, 6ZL, 6ZFO, 6ZS, 6ZDO, 6ZBE, 6WQ, 6WH, 6VF.

The Editor,

Amateur Radio,

Dear Sir,

The following account of a recent experience might provide food for thought in the current controversy over CB radio.

I walked into the store of a well known supplier of electronic gear and stood waiting to be served by a salesman who was already serving a rather scruffy looking youth. On the counter between them there was an imposing-looking range of gear consisting of a so-called CB transceiver, a mobile antenna and a set of base to wall, and co-ax cable and plugs. The customer was in the process of paying over money for the gear. I overheard the following conversation between the salesman (S) and the customer (C):

- S: "You will get a lot of fun out of this gear Everybody's in it now."
- C: "Yes. A lot of my mates are in it. While I'm here, could you tell me how to hook it all up?"
- S: "You won't have any trouble. You can mount the transceiver anywhere in your car where you can get to it easily. Then take this cable through and connect it to your battery. Then mount the antenna on the car. It would be best on the top of the roof. Then run this cable down into the car and connect it up to the transceiver with this plug."
- C: "How do I connect this plug to the cable? Does it just screw on like a power point?"
- S: "It's a bit more complicated than that. One of your friends would probably be able to show you how to do it. If not, you could bring it back in and we would do the job for you."
- C: "How do I work the set?"
- S: "It's very easy. You just turn the switch on to one of the channels. Some of these channels are for America, so you won't get anything on them, but just switch it around until you hear someone talking, and then you can talk back to them."
- C: "What do I say?"
- S: "Just talk the way you usually do to your friends. Be sure to press this switch on the side of the microphone when you talk, otherwise they won't hear you."
- C: "I'm glad you told me that. What do I do if I can't hear anyone?"
- S: "Just say CQ followed by your call."
- C: "What's a call?"
- S: "That's your call sign. If you don't have a licensed call sign you just make one up for yourself. If you listen to other people talking, you'll see how it's done."
- C: "I don't have a license, so I'll have to make one up. Is there anything else I should know?"
- S: "No. You'll pick it up as you go along. After you've listened to others for about an hour you'll know how it's done. By the way, when you switch to this channel here, you might hear a

beep beep now and then. Don't take any notice of that. It will only be one of the Hooplas. They won't worry you too much and if you talk loudly enough you'll get through. If there is too much beeping, just switch to another channel."

At this point I pocketed my meagre list of required components and we walked out in a quiet. As one who had a long hard grind with the AGCP not to mention the inordinate delay in the conduct of examinations and the marking of papers, I did not think it would be wise to trust myself to deal with the salesman in the frame of mind which had developed during the course of the overhead conversation.

Fred Harron VK2BHE,  
President, Summerland Radio Club

The Editor,

Dear Sir,

I herewith protest most emphatically concerning the insertion of the December 1976 AR of the advertisement by Audio Tele Communications Pty. Ltd., which faces page 11.

I draw your attention to the fact that this CB advertisement has no place in AR, regardless of the income to the WIA which it provides. There is such a thing as inflated money and the advertisement which a purely CB should not have been accepted.

This probe by the CB industry and perhaps by the Federal Executive is not going unchallenged. Under this practice continues then react on and distribution will surely follow.

Advertisement of CB equipment as suitable for Novice use, and so stated, in combination with items of specialized amateur VHF and HF equipment are tolerable. However, advertisements relating exclusively to CB equipment and without the CB references deleted, are not, in my opinion, admissible in AR, regardless of loss of revenue.

Please note that my concern is with the principles and ethics of advertising involved here and in no way is any criticism of the item of equipment, its suitability for amateur use, or its technical specification implied or should be inferred.

Finally, may I stress this point, that any repetition of 100 per cent CB advertising in AR will inevitably require a re-evaluation of the intent and integrity of the entire Federal Executive the WIA by the membership.

Sincerely yours,  
George Harmer VK4XW, MWIA, Old Division

The Editor,

Dear Sir,

My recent letter to the editor on Morse code has brought no response that am aware of in the various groups who send so much tuition to would-be amateurs. There are a few other points perhaps that need to be stressed as well as those previously expressed.

A variety of tutorial groups conducting theory classes for the amateur and novice have approached the Postal and Telecommunications Department for syllabuses for these exams. Why I can only assume so that they then know exactly what to teach the prospective amateurs the things they are likely to be asked in the examination.

However, apparently this query has never been presented in relation to how the Morse code is to be taught at the exams. Since you would not tutors would want to prepare their students so that they would PASS the Morse examination. After all, isn't the name of the game to get as many students through the examinations whether the subject be theory, regulations or Morse?

"By the way, I would not want to put any tutors and other so-called experts that the Morse

# ELECTRONIC ENTHUSIASTS EMPORIUM

ITEMS OF INTEREST TO HOMEBREWERS. See current issue "Electronics Today International" for more detailed listing of components.

## TRANSISTORS

BC107	18
BC108	19
BC 109	19
BFY50	78
MPF102	55
MPF103	.85
MPF104	1.10
MPF105	.85
MPF106	5.9
MPF131/121	1.30
2N706A	.98
2N918	1.80
2N2222A	.95
2N2905	.95
2N3055A	.50
2N3642	.45
2N3819	1.25
2N5245	.85
2N5580	7.75
2N5551	9.40
2N6084	17.50
40637A	2.25
40673	1.65
40841	1.50
MRP603	7.90

## 74 SERIES TTL

74500	1.15
74574	1.80
74512	2.50
745196	5.95
7400	.38
7404	.38
7474	.68
7488	3.80
7480	.65
74121	.75
74145	1.85
9001	1.50
9388	3.20
74C90	1.95
82590	5.95
95100	P.O.A.
11C90	P.O.A.

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2M CONVERT	2.50

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CA3140/T	1.55
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LM373	4.70
LM555	.95
LM556	2.75
LM562B	9.99
LM585	2.90
LM567	3.50
LM723	.95
LM741	.48
LM1496	1.80
LM3900	1.75
MC1350	1.80
MC1351	1.85
MC1488	6.50
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MC7805	2.50
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MC7815	2.50
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TA3000	2.90
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8 PIN	.38
14 PIN	.38
16 PIN	.45
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IRRESPECTIVE OF MIX	
T-12	.70
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T-37	.80
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5027/6PLB	20
7180CAN	10
5200/APLB	25
7300CAN	25
F16 or F29	.12

## DIODES

ZENER5 400mW	35
ZE NERS 1 3W	72
BA102	50
BB105G	.85
EM402	.20
EM404	.20
EM408	.20
IN914	10
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Transformer Biss.	
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PLENTY OF PARKING AT REAR

DON'T FORGET P/P

must be their own particular brand is a bit like saying you're going to drive on the right side of the road in a country where the law says that all vehicles must stay on the left side of the road. Sooner or later you will hit or be hit by someone who is abiding by the road law, you could be dead or injured, is it therefore not unreasonable to expect that there is some recognized moral standard—there is and it is specified exactly in the International Telecommunications Union Telegraphy Regulations. Australia, along with most of the countries of the world, is a signatory to the ITU. The Morse code characters and spacing is specified as follows where the dot is considered the unit of character length—

The length of the space between elements of a letter equals a dot, a dash equals 3 dots, the space between letters equals 3 dots, the space between words equals 7 dots.

Many instructors say that the characters should be sent fast with big gaps and that as the speed is increased the spacing between letters and words is reduced. That is all very fine if you are being taught Morse for the Service or such like where they train you for a specific terminal speed. But for amateur purposes what speed will be your terminal speed 5 wpm, 10 wpm, 30 wpm? Perhaps the terminal speed should be 5 wpm for Novice with characters sent at 5 wpm rate when you are sending 5 wpm and gradually reduce the spacing until 5 wpm is being sent. 10 wpm more terminal speed could be sent at 10 wpm character rate at 8 wpm, gradually reducing the spacing until 10 wpm is reached.

To would-be full call amateurs and novices, I suggest that it is a waste of the tutor's time, your time and the examiner's time if you are taught on non-standard Morse—after all, you do want to pass that pesky Morse exam. If your tutor sends the wrong Morse, change tutor or ask him to send ITU Morse. Whether the Morse should be ITU or not is immaterial; the point of the exercise is to pass the exam and if it is sent ITU standard, as I gather it is to that standard. One final point stop whinging and griping about the Morse exams. If you do some practice and will yourself to pass, you will.

Yours faithfully,  
Rodney Champness VK3UG.

**The Editor**  
Dear Sir,  
I would like to comment on Chess via Amateur Radio January '77.

To play or Not to play? That is the question.  
To play?—Back in August '72, VK9GN, Gene in Ukarampa, called CQ Chess CQ . . . on 20 m. Intrigued I replied and from then on some very enjoyable and challenging 1 mas ensued.

Kelar, Dave VK6DO Jim VK6JX (Kalgoolie) and Bruce VK6QR joined in.

Calls from VK, ZL, K, Europe, and Asia were acknowledged. Centra Europeans and Russians were most interested as chess is their No 1 pastime. Gene and I had all the DX we wanted between moves.

On one occasion VK6DO and VK6QRN were in session, I tuned just in time as QSB between Darwin and Ukarampa was making hard copy and stood by relaying moves, 5000 km for each move. Dave and Gene finished the game.

Not to play? About mid '74, the axe fell. Bruce and I were playing on 40 m, a good band for VK3 and S. Some days later I received a notice from our Advisory Committee stating that playing chess on the Amateur Bands was forbidden and that call signs were not given at the required periods.

I assure you, identification was given at the correct time. There were intervals between moves but the frequency was clear. We had to QSY many times to finish the games.

Naturally we abided by the ruling and as not to tempt the wrath of officialdom to descend upon us, went QRT on chess.

There is one thing for sure. I really miss that familiar "Pawn to Echo 4"

73. Len Pearson VK3LP.

**The Editor**  
Dear Sir,  
After reading the editorial comment by the Moorebairn and District Radio Club (December '76 AR), several thoughts come to mind.

Firstly, why should the amateur service just freely give up its 27 MHz allocation just because

some so-called Citizens' Band service would like to have it, so some retailers can line their pockets with the great god "money"? If the amateur service freely gives up 27 MHz then why don't we just give away 40 metres as well, after all the commercial interests won't go away, and what of 15 metres, might we well give 15 up as well, there's not much activity at the moment. Why don't we amateurs just give up all our frequency allocations to any other service that may lay claim to them?

I can't for the life of me see a CB type progressing on to an amateur licence. Surely with the Novice scheme now operating anyone who is "fair dinkum" would study for the Novice licence and not opt for a CB licence.

While I don't oppose the principle of a so-called citizens' band service with its dubious advantages to the community, I do emphatically object to its establishment in an amateur band.

If such a CB service is needed, then why not establish such a service in a higher part of the frequency spectrum where it could provide a constant short range reliable communications system.

It's about time we stood up and fought to retain our frequency allocations, rather than lying down like "a damp squid" and giving our bands away to any other service that may lay claim to them. If we lose 27 MHz to these poachers, without so much as an argument, then why won't we lose any other band for any other reason to whoever might want it.

Glen Molloy VK2AGM.

## QSP

### PROGRESS

Pat Hawker writing his T.T. column in January '77 Radio Communication has this to say on the subject of how good is good enough—

"The other day, reading an excellent and informative article on optimum HF receiver design by Ulrich L. Rohde, DJ2LR ('Ham Radio' October 1976), I found myself thinking 'how good is good enough?' The solid-state techniques described by DJ2LR are basically those which have gradually gained acceptance for the very highest quality professional general-coverage receivers costing thousands of pounds, up-conversion to VHF, roofing as well as selective crystal filters, elliptic filters, etc. While we would certainly not wish to deter anyone from tackling the design and construction of such an advanced receiver (though we still feel that for an HF amateur-band receiver an L.F. of 9 to 10.7 MHz is probably high enough and presents fewer problems) we suspect that only a handful of amateurs could or would construct such a project, although of course many will wish to understand such trends. For many years the electronics of communications equipment has been getting progressively more and more complex and less and less within the economics (and sometimes the understanding) of the average amateur. Yet the competitive nature of amateur operating has encouraged the view that we all need 'optimum' equipment. Sometimes it seems that everyone is having to run faster and faster to stay in the same place; not only ever more complex receivers and transmitters but also all the ancillary equipment to go with them.

Now if an amateur wants to buy a fully-equipped, all-mode, highly-professional station, that is his or her affair; my concern is rather that we need to reassure newcomers that they do not have to spend a mint of money to take any sort of active or useful part in the hobby, plus sometimes a worry that the whole hobby may eventually blow itself up by trying to become too professional, at professional prices."

He concludes his remarks with these observations—  
"So, sure; as amateurs we need good equipment, and we need many of the latest techniques. But we also need occasionally to ask ourselves just how good is good enough. If not we risk 'golfing obsolescence' and blinding off more than we can chew in seeking 'optimum' equipment. Then again, do we really need to eliminate manual controls and adjustments and human input in decisions of running our stations from microprocessors and electronic memories? After all, amateur radio is still a hobby for humans, not yet for computers."

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Noise figure typ. 2.8 dB

Overall gain: typ. 30 dB

IF: 28-30 MHz 9-15 V 20 mA.

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Eric Jamieson, VK5LF  
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JA	JA3J, Japan	82.560
HL	HL5WJ, South Korea	80.110
KH0	KH0JDX, Guam	80.110
KH2	KH2EQJ, Hawaii	80.104
ZL1	ZL1VHF, Auckland	145.190
ZL2	ZL2VHF, Upper Hutt	145.170
ZL3	ZL3VHF, Palmerston North	82.500
	ZL2VHF, Wellington	145.290
	ZL2VHF, Palmerston North	145.250
	ZL2VHF, Palmerston North	431.880
ZL4	ZL4VHF, Christchurch	145.270
ZL5	ZL5VHF, Dunedin	145.200

**WELL** was a DX season! Finding something like the Q of times with a. States being available during a single day many times. As I reported last month, the good openings started a little later this year, but they lasted longer. The signals were generally good, and they have been. One of the more consistent signals around has been Ken Y-BKCM in the New Hebrides, who has been worked in all States, with signals to 58 at times. The distance between the station and the New Zealand stations is 2,000 miles or 3,400 km. New Zealand stations have been heard with greater regularity this year, either there are more stations keeping on the air or conditions are better looking that way. The New Zealand stations are also a little better. An interesting feature of the stations worked in the New Hebrides and New Zealand has been the signal strength, many dB over S8 at times, which is a bit rare in VK5 area. Most double hop signals are heard with a signal strength of S8 or less, at least on through the second hop. This leads me to believe that the signals this year on the 2000 mile circuit have been by some mode which does not involve second hop, like extended Es or E-skip. The signals have been very good. On all these paths, however, there have been strong signals also from the intervening distances, while Y-BKCM has been S9+, then so have been the VKAs, when ZL 1-9+ so is VK7 and so on. The signals have been very good, and the strong VK3 signals, indicating a lower overall

What has been of interest this season are the large number of low powered stations operating, many with IC502's, etc. In a brief look through my log book I note ZL1G1 6w, VK2ZAF 3w, VK7ZMN 3w, VK4ZWP 5w, VK2ZIB 2w, VK2ZAY 1w, and lowers! of all kind VK4R20 50 watt! Red Ants were 10, 5, 7, so that's not a bad effort. There are a couple of stations that use low power stations not necessarily documented plus the army of stations using FT602 or TS700 gear running 10 watts. All this is very fine when band conditions are good, but operators running QRP rigs to only quarter-wave whip aerials make me wonder if they are not better off with a more optimum antenna department. How about an improvement in the antenna department you guys, say a 4 element beam—it will work wonders with your small rig, and will be heard better under poorer conditions. There is absolutely no doubt in my mind that the antenna is the key to good DXing. If you have a small antenna system located in good areas, you

It has been suggested that an HF net be formed for operation perhaps once a week, preferably on a Monday or Tuesday night, to encourage the exchange of ideas and thoughts for the use of 144 MHz on a greater scale, to pass on information of new and impending stations equipment and use, etc to inform those in the net and interested parties.

of what is being heard on 144 MHz and when, advance notice of possible good propagation conditions.

Additionally, six metre operators will be encouraged to join in any discussions, and probably those on 144.2 MHz, as there will be more to disseminate from both those bands. The total outcome of course is to encourage greater use of the vast amount of equipment which is currently available for use on VHF bands, and which for a great part of the year is not used. To provide a greater coverage throughout the year, it was suggested a net frequency of about 3580 plus or minus 0.01 MHz. The original time suggested was 0930Z, but there are problems with this time and the proposed frequency. Firstly, 3580 would be useless for VK6 at that time, also it would be too early as that would be only 1230 local in Albany and Perth and most likely operators would hardly be home from work. To operate on an all-year-round basis on 3580 a time not earlier than 1130Z would have to be considered, which should not be too late for the likely interested operators in the eastern States, and probably conditions would not be too bad for the West. Problems again arise from the use of summer time in some areas making a further hour difference, and yet 60 metres seems the only band likely to be of use to operators listening to other stations in their own call areas. 60 metres would be a very good band of skip distance problems. Anyway, what do you think? I would suggest a Tuesday night as being the most consistently suitable here, but then I am thinking of myself! But it would be close enough for the week-end just passed for info. to be current. What about bands and/or frequencies? Can he cater for Z and N calls satisfactorily, e.g. cross band operation? Please think about all the above, also what about a net controller, and from which State would he be best to operate from?

#### MOONBOUNCE REPORT

Lyle VK2ALU through "The Propagator" reports not much return for their efforts during December. Scheduled tests with 600 and 1.3 MHz on 14/11 provided no signals other than their own echoes to a max. of 7 dB above noise.

A special test requested by K3FGP was run on 27/12, and despite an extension of the period to a total of 1 1/4 hours, the best report they could give him was "1T" copy, as his signals did not make it over 3 dB above noise. He indicated that call areas 30 metres and above from various locations were copying their signals well. From his ears must be better than those at VK2AMW. On this occasion Lyle reports their own echoes were received at approx. 45 degrees varied polarisation, thus causing 3 dB in strength to a max. of 3 dB above noise. Both test sessions were attended by VK2ALU, VK2ZEN and club member Peter Vernon.

A new output audio amplifier is being made up, with modified frequency characteristics, to see what effect this has on readability of signals.

Chris VK5MC mentions having heard ZL1BJG calling on 144 MHz EME on 6/11. No other details at this stage.

#### BITS AND PIECES

The further beacon news. Advice is to hand that the 432.000 MHz beacon in Adelaide will be still using 432.400 and will be radiating with a 6 dB gain antenna. It will be interesting to observe the coverage of this beacon and whether it will be subject to any increase in coverage with improved band conditions as noticed on 144 MHz.

Aub VK6YK advises the shifting of the Albany beacons to Mt. Adelaide, about one kilometre south of Albany. This now means the four beacons located there will now all be at the same site, namely the two amateur beacons on 52.950 and 14.450 MHz and the two commercial beacons on 130.550 MHz and 170.550 MHz. For those in Adelaide particularly who monitor the Albany beacons these changes will be welcome.

Aub mentions also that Bernie VK6KJ is now on 432 MHz, and hopes soon to be on 1296. Watly VK6WG is now on 1296. Bob VK6BE is now operating on 144 MHz on 22/12. It is to be hoped that some of the Adelaide boys sitting in prime positions near the shoreline will be doing something positive to provide the other end of the path. 1296 to Albany appears now to be only a matter of time. Ron VK3AKG no doubt will be watching the situation with interest.

On 11/12 I observed at my QTH at 0400Z a sharp rise in noise on six metres, and on investigating I noted a number of strange JA signals

on 28 MHz. Looking down at the 50 MHz end of the band I heard a lot of TV rubbish with sundry carriers between 50.3 and 50.8 MHz around 54. A steady carrier was noted at 53 on 50.110, but no idea why. I was listening on 0424, so a possible opening to JA didn't quite make it.

It has been noted with much interest that throughout the excellent 6 metre openings we have been getting this year, that quite a large degree of backscatter signals are here and being worked, and it does appear to be more prevalent when long haul DX is operating. For those new to the game backscatter signals are usually weak (around S1 to 4), can be fluttery and usually have a hollow or echoing sound. They are generally perfectly readable though, and many contacts are made by this method. They will be heard from, say, VK4 when you may have your antenna on VK6 as an example, and you can prove the situation by turning your antenna in the direction of the station you are hearing and the signal will disappear. Quite an interesting form of contact.

John VK3ZBU has written with some observations he has made on VHF this year. He mentions the extremely good conditions prevailing on 21/11 when ZL signals were so good, and goes on to give support to what I have already said about these transmissions being other than double hop due to their extreme strength. John is equally interested in the large number of very strong signals, particularly from VK1, and I must agree with him in regard to VK5 anyway, I can never recall hearing signals from there so strongly as this year.

John adds further strength to the plea for us to spread out further on the six metre band. He wonders just how it is possible for stations in ZL, P29 and Y8 to effectively work VK stations when all are cluttered together in less than 100 kHz, and with so many calling whilst these stations are in QSO with others. On this point it does seem evident from many observations that stations in some States are calling their long distance stations on spot, without actually hearing them. How else can one explain why they continue to call say Y8KMM when he is already in QSO with another station in another State?

On the matter of long haul DX John speaks of activity on 10/11 worked ZL3QG, worked Gary P29GR, Graham VK3QZC in Darwin, VK6BYT in Kalgoorlie. That's certainly spreading the signals around! VKTMC and VK7JV worked ZK2CJ, while VKTMC also worked VK5ZBH, the newcomer at Ceduna, who has virtually filled the vacuum left by Kerry K5SU when he was transferred to Moree, N.S.W.

I guess that's about where I had better stop. It has taken a long time to prepare these notes this time with so much info. to be sifted and placed in some sort of order. In the next issue I will present a summary of observations covering the overall VHF activity for the early summer period of operation.

Closing with the thought for the month: "February is when millions of bright, shining, happy, laughing faces turn towards school. They belong to mothers."

73. The Voice in the Hills.

## INTRUDER WATCH

Alf Chandler, VK3LC

1256 High Street, Glen Iris, 3146

It is interesting to read a Memo issued by ARRL, and I quote—"The Intruder Watch program has been publicized recently in the form of a WIAW Official Bulletin and the response has been fantastic. We've already added about fifty new members to the program so far, and many of them are already on the active list."—I am sure they can do this in the US if it behoves us to act in a similar way, don't you think?

More Observers are needed in all States. More information is also of interest to us in Region 3, and I quote again—"Since late June, Treaty activity has been taking on the following counts: 7050 Cairo A3; 7060 Peking A3; 7055 Tirana A3; 7075 Cairo A3; 7060 Peking A3; 7072 transmitting the latter 'Q' A1, near Moscow; 14208 and 14300

F1, near Moscow. This does not mean that reports on these should stop coming in! If a station does not cease interfering after receipt of a formal complaint, then we intend to continue complaining, and initiating Treaty action, and this will result in a collection of evidence which will be instrumental at the 1979 WARC." Unquote.

This applies equally to our Administration, and complaints are being forwarded to countries allowing intruders to transmit in our bands. A case in point is the Japanese fishing boats operating in Australian waters on frequencies in the 3.5 MHz band, and also the pulse signal heard on all frequencies from time to time. This pulse, as you know, is on all HF frequencies at different times and causes interference to all Services using the high frequencies. I was interviewed recently by VK6LJ for the ABC program "Club Forum" with regard to that same subject. They had received letters from their listeners complaining of the interference.

Referring to pulse transmissions, yet another one has been heard in the 21 MHz band. Whereas the one mentioned above has been measured here at my QTH and transmits 27 pulses per second, this one is slower at 5 pulses per second, but just as loud and from the same direction. It is a wide band pulse, and seems to sit on a frequency for some time before moving. More reports on this one would be appreciated.

## WICEN

Emergency communications were set up and operated by radio amateurs in the Hornsby area on 3rd to 5th December last during severe bushfires.

In a note, Tony VK2BTL, said the President of the newly formed Hornsby and District AR Club, Barry VK2AAB, contacted the local SES offering assistance.

The offer was accepted. Control centre was sited in the Hornsby Shire Council chambers. A call was put out for amateurs with mobile equipment. The response was excellent. Some went to trouble spots with fire fighters, some went to remote places and others operated as spotters. The club call VK2APF became net control.

The activities lasted over 30 hours so shifts had to be arranged. Assistance was given by the NSW Division and the VK2 VIC organisation. The Ch. 8 dual repeater and simplex channel 50 were used for the emergency traffic communications.

Towards sunrise on the 4th there was a total power failure in the area and for some 15 minutes the amateur nets were the only means of communication. Heavy pressure on the telephones meant that additional channels were essential. Some 60 to 70 amateurs assisted and many others volunteered but were not required.

Further amateurs were put on standby, with first aid kits in the area. Householders who had their police activated WICEN in that area. Fortunately these fires were brought under control reasonably quickly.

## AR AWARDS

The Publications Committee have pleasure in advising the following awards granted for the year 1976—

HIGGINBOTHAM AWARD:  
Mr. Maurice Evered VK3AYO.

[NOTE: The Committee recorded appreciation for the work of Mr. Roy Fisher VK3QGM for AR but regretted inability to grant this Award to him because of his membership of the Committee.]

#### TECHNICAL AWARD:

Mr. R. A. J. Reynolds VK3AAR for his Linear Amplifier articles in the issues of April, May and June.

#### ASJA:

Mr. B. J. Morgan VK7RR for his repeater article in September.

# 1977 SUBSCRIPTIONS REMINDER

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FDX 400 Transceiver, good condition, \$325. VK2AAC, 20 Timaru St., Kiriwae 2232. Ph. (02) 521 7080.

Oscilloscope, solid state lab. instrument, Fairchild type 768H with 50 MHz dual trace and delayed sweep plug-ins, very good condition, complete with leads, probes, set of manuals, \$650. VK2HS, 23 Brisbane Street, Bondi Junction 2022. Ph. (02) 587 2492.

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IC22 2 m FM 10W mobile, fitted for repeaters 2-8, reverse 2-8, simplex 37, 40, 43, 49, 50, 51, with mic., manual, all cables, brackets, etc., \$165 ONO; IC2020 2 m SSB, portable, as new, with crystals for 144.00-144.60, plus Oscar, with mic., manual, all cables, etc., \$135 ONO; Shew MR-2 pocket sized VHF monitor Rx, 12 channel, fitted for VK3 police and CFA, with nicad battery and charger, \$55 ONO. Ray VK1ZJH, 19 Gangurra Cres., Rivett, A.C.T. 2611. Ph. (062) 88 5624.

IC202, only three months old in as new condition, complete with all original extras, packing case, mike and case plugs, etc., English instruction manual and Vicom warranty, 144 to 145 MHz crystals fitted plus Oscar crystal 145.5 MHz, \$150. VK6BG, QTHR.

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ICOM 21A, base/mobile FM 2m transceiver, includes xtals for 11 channels, as new, only \$210. Ph. (03) 467 2131.

From estate of the late J. Georgeson VK2AKU: Hallicrafter Tx HT37, \$150; Hallicrafter Rx SX100, \$125; Ferguson transformer 240/115V 750VA, for sale with the above equipment, \$55; 30 ft. free standing steel tower, with prop pitch motor, sail-sys. and their power supplies; purchaser to arrange dismantling and removal, \$295. VK2AJL, QTHR. Ph. (02) 41 7729.

Kirk Super Quad, 2 el., 14, 21 and 28 MHz, fibre-glass spreaders, new and unused, complete with all wiring, instruction book, etc., not able to use because change of QTH in new year, \$200. VK3OC, QTHR. Ph. (03) 29 4260.

### WANTED

Still looking for Vintage Morse Keys and pre-WWII parts and gear. Any type, condition, will buy or swap. VK6B, QTHR.

Illustrator needed for simple humorous pen sketches on AR subjects. If anyone can help please write VK4SS, QTHR.

FV60 VFO for FT75B; also manual or photo copy of manual for FT75B and AC and DC P/S. Notify details including price to Ray VK1ZJH, 19 Gangurra Cres., Rivett, A.C.T. 2611, or phone (062) 88 5624 (A.H.).

Antenna sold for the RX section of a vane spider BR5-2 marine transceiver. Details Michael, 90 Edithvale Road, Edithvale, Vic. 3188. Ph. 772 3175 (A.H.).

Any information re circuit, operation or connections of APX6 radar transceiver. VK5RI, QTHR.

Steam engine and generator to power type 3 MK 2 transceiver. Also wanted airborne radar systems, scanners, CRO indicators, duplexers, test sets, harnesses, handbooks, i.e. A278, H28, AP-8, AP-8A, AP-83, Ruckus, Europa, type 117. Details to W. Babo VK3AGB. Ph. (03) 537 4802.

Wanted urgently by Volunteer Bush Fire Brigade. Your surplus and working hi-band carphone (Pye overland for preference as the mobile mount is already on fire trucks), plus handbook or schematic for photocopy. Limited funds but your expenses happily paid. Don't delay, the fire danger will be high for some months. Please write or despatch today to Les Kinch VK2BSD, c/- Bush Fire Brigade HQ, Terry Hills, NSW 2084.

Urgently need to keep communications going during high bush fire danger period. Handbooks/schematics for Pye overland, AWA carphone, vinton, etc. All high-band models. Can photocopy if needed and return. Please don't delay. Contact or despatch today. Expenses paid, and all letters acknowledged. Les Kinch VK2BSD, c/- Bush Fire Brigade HQ, Terry Hills, NSW 2084.

Speaker Transformer, 10,000 ohm, primary CT, 3.7, 8 or 15 ohm secondary. Colin Graef, Cavendish P.O. 3408. Ph. (065) 74 5211.

RT11/APG38, complete or incomplete. Replies to D. A. Page, 76 Castlereagh Street, Parrish 2750, or ph. (047) 31-1311, ext 726 (bus.) or (047) 21 8102 (A.H.).

## SILENT KEYS

It is with deep regret that we record the passing of —

Mr. IVOR MORGAN VK3DH  
Mr. L. J. SALTER VK4XS  
Mr. R. J. EVERINGHAM VK6BO  
Mr. H. S. DOWNIE LB6250  
Mr. W. J. HARWOOD VK3ZD  
Mr. STANLEY H. MILLIGAN ex-VK2AD

ROLAND JOHN EVERINGHAM VK6BO  
Rolo Everingham VK6BO died suddenly on Tuesday, 9 November, 1976. His death is a great loss to amateur radio and especially VHF in Western Australia. Rolo became involved in VHF in the late 1940s. It was he who made the memorable contacts on 144 MHz to VK5GL and VK5OR in Adelaide from Perth in 1951 and 1952 respectively. The Adelaide/Perth path has not been re-established since that time despite increased power and activity at both ends. Rolo remained keen on 144 MHz and could generally be heard using MCW on 144.22 MHz during 5 metre openings to the Eastern States.

He was active on 6 metres and is the only Western Australian to have ever won the Ross Null VHF Contest Trophy.

Not content with 6 and 2 metres, Rolo built one of the first crystal controlled transmitters on 288 MHz and held the WA record for that band until it was withdrawn. He was active on 432 MHz and made many contacts through Oscar satellites.

His tenacity with VHF experimentation and propagation was evidenced by his early morning (06.45) skeds with Wally Green VK6WG. These persisted over many years and established that a 400 km path to Albany could be worked virtually every day at that hour. The same path had less success over the Norseman/Perth path but the presence of these signals served as a benchmark for other amateurs who participated from time to time in these tests.

Rolo fostered young people interested in amateur radio. Much of the impetus for the early 2 cm call holders came from Rolo's quiet assistance—both to gain a call sign and then to use it. He was able to help solve the technical problems VHF in a period when TV components and 2-way mobile radio were not in existence in Australia.

Rolo was a founder of the WA VHF Group Inc. and was one of the six signatories to the latter widely circulated seeking intentions of the 80-84 MHz band when the introduction of TV had shifted the 6 metre band to 56-60 MHz.

In his professional life Rolo was the Principal of the Mount Lawley Technical College before retirement. This College was the major institution for trade, Certificate and Diploma teaching in Electrical and Electronic Engineering and for TV servicing production and transmission. Hence in an amateur and a professional sense Rolo Everingham made an outstanding contribution to electronics in Western Australia.

He is surely missed.

W. J. House, President  
W.A. VHF Group (Inc.)

### EXCHANGE

Swap 4 x 125A tubes (list price \$63.90 ea.) for four 6AU6 tubes (list price \$2.25 ea.). VK6RR, QTHR. Ph. (039) 81 2558 A.H.

Anyone interested in used stamps? Cleaning out an accumulation of over 40 years, loose and on covers, Australian and foreign from all over, several post boxes, will make swaps for any pieces early wireless gear in any condition. VK4SS, QTHR.



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● **BACK ISSUES** of Amateur Radio are available to members. Some issues are out of print however. Issues March to May 1972 at 30c each, June '73 to Dec '74 at 40c each, Jan-Oct '74 at 50c each, Nov '74-Aug '75 at 70c each, Sept '75 onwards at 90c each. Calculate average weight as 120g per issue.

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